

RESEARCH ARTICLE

Investigating science teacher educator identity through the politics of domestication and critical positional praxis

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Abstract

The focus on identity in the field of teaching and learning continues to grow, especially when it concerns equitable outcomes for students. While most attention is placed on students' identities and increasingly those of teachers, lesser addressed are the identities of the teacher educators and researchers broaching the issue of identity. Additionally, identity research is not often linked to relationships between self, others, and transformative action. We recognize these as gaps to be addressed and offer *critical positional praxis* (CPP) as a response. CPP is the public manifestation of the insights gained through our sense of identity and reflexivity. More specifically, CPP is the actions (or inactions) *that express who we are* in response to an event in any given social context—especially oppressive ones. In this article, we draw from our own critical autoethnographies, as a context for putting CPP into practice in identity research. Our collective analysis of these critical autoethnographies revealed how our identity development was inseparable from the ways in which we have each resisted the politics of domestication. Our autoethnographies further point to the role of dissent as central to our experiences of becoming critical science teacher educators committed to equity, diversity,

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and anti-racism in education. We draw from this analysis to offer recommendations for how identity and positionality can move beyond theoretical constructs toward transformative personal and collective change in science education.

KEYWORDS

critical positional praxis, politics of domestication, positionality, sociotransformative constructivism, teacher educator identity

1 | INTRODUCTION

True resistance begins with people confronting pain... and wanting to do something to change it.

—Bell Hooks, *Yearning: Race, Gender, and Cultural Politics* (Hooks, 2014).

Throughout our lives, we (the authors) have had the blessing of living and learning in many different places in the United States and in other countries. These experiences have provided us with numerous opportunities to explore and reflect on our identities and on the multiple positionalities we can inhabit in any given context. We have also become aware that having a strong sense of self and purpose is not enough to define one's identity because the beautiful fluidity of the identity construct can also produce significant challenges when other individuals (either consciously or subconsciously) choose to (re)define how we identify ourselves. This issue is particularly challenging and often detrimental to traditionally marginalized individuals, such as Peoples of Color, women, disabled people, queer communities, and many others who do not fit mainstream norms.

Much has been written about the construct of identity in various scholarly fields (Aguirre et al., 2013; Lave & Wenger, 1991; Martin & Gholson, 2012; Wenger, 1999), and identity is a prominent construct within feminist scholarship (e.g., Harding, 2004; Collins, 2002). The construct of identity has also gained considerable attention in science education research over the past two decades (Avraamidou, 2014; Mensah, 2012, 2016). However, we argue that, in science education, there is a need to consider more critical conceptualizations of the identity construct from the standpoint(s) of science teacher educators whose work is focused on social justice and who have (and are) inhabiting extremely different cultural spaces from their own (Parsons & Mensah, 2010; Rivera Maulucci, 2012; Rodriguez, 2005; Tolbert et al., 2018). In addition, we argue that as a field we must move beyond theoretical conceptualizations of identity awareness and processes of identity development in science education to theories that enable us to turn new insights and understandings about identity into transformative action.

In this article, we draw from own experiences in the form of critical autoethnographies, to illustrate how three scholars (one Anglo American white woman, one Afro-Caribbean woman, and one Latino) sought to establish our identities as critical science educators in various cultural and institutional contexts. We further describe how we maneuvered through and often pushed back against normative socialization forces that aim to deny or redefine who we wish to become as science educators working for social justice. To this end, we deploy *reflexivity* as

described by the sociotransformative constructivism framework (Rodriguez, 2011/1998) and the *politics of domestication* as a lens to assist in analyzing and explaining negative acculturation processes in communities of practice (Rodriguez, 2006). We also put forth *critical positional praxis* (CPP) as a useful tool for moving beyond descriptions of identity development or the processes others encounter (e.g., teachers). We suggest that CPP is a heuristic that both researchers/science educators, students, and research participants can deploy for promoting more focused transformative action in the process of identity development (Rodriguez & Navarro-Camacho, 2022). These concepts are further explained below, but we first begin with a brief discussion on identity research in the next section. We then employed a critical autoethnographic approach to analyze our experiences using CPP as an analytical tool. As such, we reflect on how each of us operationalized CPP in our working contexts. In the spirit of honoring the ways in which we are all in a constant state of “becoming” (Frausto Aceves et al., 2022), we close with some recommendations for how science teacher educators/researchers can become more critically agentic in relation to their identity and positionalities in the context of their (our) work (Tolbert et al., 2018).

2 | THEORETICAL FRAMEWORK

2.1 | The absence of “I” in teacher education identity research

Rivera Maulucci (2012) have illuminated how science education researchers, including those doing identity research, rarely identify how their own identities, including race/ethnicity, gender, institutional status as university academics, and so forth, impact their positioning, or how they, for example, navigate “their insider/outsider status as social justice researchers from [elite institutions] working in a high-poverty community” (p. 590). Others have similarly argued that science education researchers need to critically position themselves within their research and more thoughtfully address the relationships between power, identity, and their research contexts and agendas (Tolbert et al., 2018). When science education researchers do disclose their identities, they are rarely included with nuance or complexity, but instead as apolitical categorical descriptors, for example, white male academic, female science teacher educator and researcher of British descent, and so forth (Rivera Maulucci, 2012).

Overlooking this “I” is unsurprising given the research tradition that has largely informed the field. For instance, in their cornerstone text on identity, *Identity and Agency in Cultural Worlds*, that has informed much work on identity in teacher education, Holland et al. (1998) used the word “I” 554 times; however, in none of these occurrences did the authors reveal their own positionalities as privileged intellectuals. Our goal is not an extensive critique of Holland et al. and other similar identity development research, but we wish to call attention to the paradoxical nature of doing identity research without explicit attention to the “I” in identity research—in particular, that is, the researcher’s positionality.

For example, and in sharp contrast with Holland et al.’s (1998) approach, Pennington and Prater (2016) conducted an incisive autoethnography of their previous research using a critical whiteness framework. They argued that “Bringing whiteness into the framework of figured worlds acknowledges the historical, socially positional, and reproductive nature of how the familiar social types in our figured worlds related to white privilege” (p. 902). Pennington and Prater (2016) illustrate well how taken-for-granted assumptions and white privilege could produce a “veil” that hinders meaning making—especially, in culturally diverse contexts. Some scholars in

teacher education have drawn from critical race and feminist traditions to articulate their own identities and positionalities, using positionality as an explicit tool of analysis in identity research (Chen & Moore Mensah, 2022; Martin & Gholson, 2012; Mensah, 2012; Morales-Doyle, 2018; Rivera, 2022; Rodriguez & Navarro-Camacho, 2022; Tolbert et al., 2018; Varelas et al., 2022).

At the same time, we are wary of how making the “I” more explicit in identity research could become a somewhat futile exercise in navel-gazing, while we also recognize that critical autoethnographic approaches to positioning oneself within science identity research can be powerful analytic tools (e.g., Frausto Aceves et al., 2022; Mensah, 2012; Morales-Doyle, 2018; Rivera, 2022; Rodriguez, 1998; Rodriguez, 2019). Therefore, our argument is twofold: (1) identity research in science education and science teacher education needs to meaningfully address the positionality of the researcher, and (2) reflections on identity should create opportunities for transformative action. We address this second point in the following sections.

2.1.1 | Embracing the complexity of “I” in identity research through critical positional praxis

We offer CPP as a heuristic that can help identity researchers bring together identity, positionality, and intersectionality with reflexivity for transformative action. We draw from feminist poststructuralist's perspectives on identity, positionality, and intersectionality to articulate that these constructs represent multiple complexities of becoming and being (Alcoff, 1988, 1991; Tien, 2019). At best, therefore, these constructs are merely analytical tools that assist researchers and educators to better understand their own and their participants' (or students') meaning making in any given social context. For our purpose, we are mindful of critical feminist scholarship which has cautioned social scientists to avoid the entrapments of binary and essentializing demarcations (e.g., oppressed vs. oppressor, rich vs. poor, race categories, etc.) (Alcoff, 1988, 1991; Tien, 2019). Similarly, we also wish to avoid the entrapments of representation that may arise from fears of “speaking for others” even when aspects of the participants' and/or researchers' identities align (Alcoff, 1991). To this end, we agree with Alcoff's notion that identity can be defined “as a political point of departure, as a motivation for action” (p. 431). Thus, although one's identity might be malleable and impacted by various social, historical, and institutional factors, we are more interested in how individuals *choose to act to assert their perceived sense of identity*.

Crenshaw (1991) explains that the study of *intersectionality* is a project that “attempts to unveil the processes of subordination and the various ways those processes are experienced by people who are subordinated and people who are privileged” (p. 1297). In other words, intersectionality describes the processes by which an individual's multiple identities (e.g., gender expression, ethnicity, sexual orientation, socioeconomic status, skin color, ability, etc.) may intersect to enable privileged access and other benefits, or render the individual a target for oppressive practices. However, our focus in this manuscript is to problematize what we choose to do (or not do) next—as critical reflection on our *positionality*. Thus, we are in agreement with Tien's (2019) interpretation of Alcoff's notion of positionality as a “set of processes” that describe power relationships. More specifically, we are interested in exploring how individuals translate into transformative action their *enhanced understandings* and *heightened awareness* of their identity and intersectionality. For instance, when being the target of racist, homophobic, or sexist practices (or even witnessing these oppressive actions), how do we move from states of *heightened awareness, shock, guilt, desperation, feeling devalued*, and so forth to significantly

counter these oppressive practices, and in what ways do these actions (or inactions) impact our identity development in communities of practice (e.g., as teacher educators)?

If we agree that our identities gain social meaning only when they openly come into harmony (or discord) with the identities of others in any given context, then, at the core of this interaction is the unavoidable duality of the identity construct. That is, having a strong and individual sense of identity is not enough if others (who are, or believe they are) in different positionalities feel unencumbered to (re)define another person's identity to serve their purposes (or affirm their fears). These individuals, whether they consciously intend to, can indeed facilitate, or create all sorts of obstacles in one's professional, emotional, psychological, and intellectual growth. Therefore, the construct of identity needs to be defined as a dialectic that both involves the critical awareness of how others may perceive our chosen identities, as well as a deep understanding of our intersectionality (or how our multiple identities intercept with one another; e.g., gender expression, socioeconomic status, education, sex, ableness, etc.).

So, being critically aware that our identity is not only defined by our own sense of self, but how others (re)construct us based on their own identity, and being aware that these interactions could either facilitate or obstruct access to a community of practice, how do we move from states of heightened awareness to transformative action? In this manuscript, we propose CPP as a reflexive approach that bridges identity self-awareness with our actions (Rodriguez & Navarro-Camacho, 2022). Indeed, CPP is the enactment and public manifestation of our sense of identity; how we perceive other people's identities; and of the meanings produced by those interactions. Thus, this approach adds a transformative action component to Crenshaw's (1991) notion of intersectionality and goes beyond describing states of self-awareness, processes of oppression, or root causes of discrimination. CPP is defined then by our actions—the actions that give our identity meaning and public presence in any given context.

As mentioned earlier, the relationship between our own sense of identity and how our identities are perceived by others plays a significant role in our personal, psychological, educational, and professional growth. Therefore, CPP enables us to reflect upon what kind of actions are available to us as we negotiate and enact identities-in-practice within particular communities, such as within science and science education (Lave & Wenger, 1991). Similarly, CPP enables us to be more mindful about how we perceive other peoples' identities and how we interact with them based on those perceptions. This means that we need to be constantly reflexive; in fact, identity and reflexivity are closely linked and influenced one another. *Reflexivity* involves engaging in an on-going process of critical self-reflection on how one's own multiple identities determine one's actions (or inactions) in any given context (Rodriguez, 2011/1998; Rodriguez, 2015).

To summarize, the difference among reflexivity, identity, and CPP is that while all of these constructs are influenced by one another, reflexivity and identity configure and provide meaning to a present version of ourselves in a given time and context. While reflexivity could be a private processes occurring in our minds, CPP, on the other hand, is the public manifestation of the insights gained through our sense of identity and reflexivity. In fact, CPP is the actions (or inactions) *that express who we are* in response to an event in a given context.

2.1.2 | The politics of domestication and critical positional praxis

In this section, we problematize privileged perspectives that describe identity development as a series of contextualized social transactions that grant needed/desired access to prescribed and dominant figured world(s) of a community of practice. In the critical autoethnographies

presented below, we argue that those normalizing standpoints ignore individuals' desires to resist suffocating conformity, as well as ignore individuals' perseverance and creative abilities to bring about positive and transformative change ... to just simply be who they choose to become (in whatever social or professional context). Seeking and gaining access to established communities of practice should not imply merely compliance or only acquiring the "accepted" social/disciplinary and practical knowledge of a given community. The process of becoming part of a community can also involve individuals' active resistance to the pre-established norms within that community, as well as their efforts to dismantle institutionalized oppressive practices—oppressive practices which are often designed to negate human flourishing, that is, truncating an individual's process of "becoming" (Freire, 1970).

To better explain how we operationalize CPP, we use the *politics of domestication* as an analytic tool to describe oppressive socialization practices, such as those that occur as the "price of admission" to a community of practice (e.g., science teacher education). Essentially, the politics of domestication is "a negative process of acculturation by which one's ideals and commitment to work for social justice are tamed and reduced to fit dominant discursive practices" (Rodriguez, 2005, p. 48). Thus, the aim of this process is to subdue, silence and dominate individuals—and especially under-represented and marginalized scholars—in ways that often contradict the very reasons why they were hired in the first place (e.g., science teacher educator with a research focus on equity, cross-cultural education, and/or social justice). The politics of domestication are the polar opposite of what Bakhtin (1981, 1986) implies when someone is socialized into a community practice's unique speech genre (or discourses) and practices that enables that community to function. In this type of process, the individual's identity, voice, or speaking consciousness (Werstch, 1991) is assumed to be welcome, heard and engaged in dialogue. This is the ideal, but what it is missing is a conceptualization (and acceptance) of the role that dissent plays in identity development research. In other words, what happens when our positionalities or identities collide with others within a community of practice, and especially with others in different power subject-positions? In our critical autoethnographies below, we articulate how CPP helped us better understand how our identity development as critical teacher educators was influenced, not only by the politics of domestication, but by how *we chose to respond* to these forces in a dialectical process of becoming.

3 | CRITICAL AUTOETHNOGRAPHY

Critical autoethnography is an ideal methodology for CPP and for our study. In critical autoethnography, researchers embrace the historically, culturally, and personally situated dimensions of their work (Gergen & Gergen, 2003). Researchers' own experiences are the subjects of the ethnographic research process and the findings derived are situated in sociopolitical and cultural contexts. Reflexivity is characteristic of autoethnographic work and generally strengthens research. Reflexivity and accounting for positionality afford researchers, especially from historically marginalized communities including Communities of Color and women, legitimacy regarding the intersectional insights and sensitivities borne from lived experiences that they bring to the analytical process in research (Mensah, 2019). The goal of critical autoethnography, furthermore, is not generalizability or universality. Accounting for biases is not the focus, but rather advancing new deeply contextualized understandings about oneself in relation to the world. In engaging reflexivity as part of the research process, this methodology "... asks the reader to accept [these critical self-reflections] as authentic, that is, as a conscientious effort to 'tell the truth' about the making of the account" (Gergen & Gergen, 2003, p. 580).

In our critical autoethnographic study, we sought to explore our identity development as critical teacher educators during times when our identities or positionalities were in contradiction within cultural and institutional contexts and impacted by politics of domestication. We use CPP as an analytic tool for interpreting and explaining how we moved forward with transformative action. We engaged in a cycle of reflection, writing, analysis, and group discussion. First, we self-reflected and documented our own trajectories in developing identities as critical teacher educators. We each chose starting points or instances that were meaningful to us. We individually wrote short narratives (approximately six pages) about our identity development as science educators committed to equity, diversity, and social justice. We then analyzed each other's narratives through the lens of the major themes of the paper: identity, positionality, intersectionality, reflexivity, politics of domestication, heightened awareness of one's identity, and subsequent action through CPP. As we analyzed each other's narratives individually, we generated memos. Next, we met as a group and discussed each narrative, along with the analytical memos. We recorded and transcribed our first group discussion. We each subsequently reflected on our first discussion and analyzed the transcript of the discussion itself. Prior to meeting again, Alberto summarized and shared emergent themes from our analysis of our first group discussion, which served as a starting point for our second group discussion.

With each cycle, we revised our narratives, including additional relevant lived experiences as academics, educators, and science teacher educators that we identified as informing our science teacher educator identity development, and deepened our analyses through the lens of CPP. We met at least five times, probing, acknowledging, and contrasting our ongoing analyses of our individual and collective reflections, and engaging in theoretical sampling as we sought to identify crosscutting themes and derive recommendations. Between meetings, we shared developing iterations of our narratives and provided ongoing written feedback. Our collective self-study supported a deepened appreciation for intersectional identity research within socio-political contexts and the refinement of a heuristic to guide us in resisting the constraints of domesticating forces and persisting in identity pathways, that is, *becomings*, as critical science teacher educators. Our three critical autoethnographies are presented next, followed by brief summarizing comments and recommendations.

4 | THREE EXAMPLES OF CPP IN SCIENCE TEACHER EDUCATOR IDENTITY DEVELOPMENT

4.1 | On disillusionment, resistance, and solidarity

4.1.1 | Sara Tolbert

I am a white Anglo-American settler from the southeastern United States, with family roots in Appalachia (mom) and southern Louisiana (dad). My family overcame poverty through joining the military (maternal grandfather) and the seminary (paternal grandfather)—an exit strategy from our “lower class” roots made differentially accessible to us through interlocking systems of white supremacy and patriarchy. I was raised in a socially and political conscious household, and the problems of the world were not kept a secret from me even as a young child. (For more on this background, see Tolbert et al., 2019.) As such, I was interested in fields of study that held potential for social and political action. For me, science, as I learned it in school, was not one of these. After graduating from university with a degree in environmental studies, I spent a

short time as an outdoor/environmental educator in north Georgia near the start of the Appalachian Trail. During that time, working with students from both rural Georgia and metro Atlanta who would visit our center for short day to 3-day field trips, I became interested in the possibilities of classroom teaching. I went on to become a junior high/middle school science and ESOL [English to Speakers of Other Languages] teacher in the South Bronx, NY and later in Atlanta, GA, and spent a few years in between as an environmental educator in Mexico and Guatemala. I have written about these experiences elsewhere, and how they have informed my development as a science educator (Frausto Aceves et al., 2022; Schindel Dimick et al., 2019).

After several years of teaching, I went back to get my Masters in education. As a white educator who had attended predominantly white schools in the suburbs of metro Atlanta, I had always felt vastly underprepared to be the kind of teacher my students deserved. Through graduate school, I was hoping to find more resources and support for working to dismantle the overwhelming inequities that constituted formal schooling and opportunities to learn science for the students with whom I would worked in both the Bronx and Atlanta. Instead, the content of the master's program largely focused on educational psychology as well as "best practices" for educating adolescents. Meanwhile, I complained in my "reflective" journal about the structural inequalities of schooling and my experiences of lacking agency within them, for example, how the predominantly Mexican and Central American ESOL students I was teaching in my field placement as part of the master's program were located in the trailers. In other words, the students who likely stood to benefit most from being well resourced and well-integrated in the school were in the least resourced classrooms, on the outskirts of the school grounds. My instructor and cohort leader would write sympathetic comments back, but beyond that, offered little support or guidance.

In the meantime, the other preservice teachers in my cohort, and some instructors, would often complain about how challenging it was to implement the "progressive" ideas and practices (e.g., groupwork, etc.) we were learning about with the predominantly Black and Latinx students in the low-income communities in which we student taught. They would often share stories of how their mentor teachers consoled them with commentaries about how the students' families just do not care, or are too poor to care, encouraging their mentees not to place blame on themselves. These racialized ideologies were seldom questioned, and even reinforced, in coursework. Yet, the "just don't care" narrative was a myth, and a trope that truncated teacher agency, ironically enough, in the context of a program focused on "teacher development" (Rodriguez, 1998). A fellow student and I wrote a letter of complaint to our program directors in response to both what we were hearing from students and instructors as well as about the lack of attention to racism and equity in our programs. In response, they held a couple of short workshops on "diversity" in education.

I chose a career in (science) teacher education for explicitly political reasons. Though I had initially planned to return to classroom teaching after completing my Masters, the whole teacher education experience made me so angry that I decided to pursue doctoral studies and become a teacher educator. Looking back on this decision from the perspective of *CPP*, I suppose it felt untenable to critique the master's program's shortcomings without also working toward addressing those shortcomings from a systems perspective. For me, that meant turning my frustrations toward a career in teacher education, where I felt like I might have the ability to make a difference in teacher education more broadly. After earning my PhD in 2011, I started my first official position as a teacher educator (assistant professor of science education) in Arizona, working with preservice teachers in the elementary (primary) science education program. I hoped to apply what I had learned about critical pedagogy in my doctoral studies with preservice teachers—to explore, for example, what conscientization could look like as a

pedagogy of/for the privileged in science education (e.g., Schindel et al., 2021). For the first few years, I worked with predominantly white middle class women preservice teachers. Fostering critical consciousness and addressing intersecting contexts of oppression (e.g., racism, heteronormativity, sexism, classism) became part of the science teacher education curriculum in my courses. For example, while learning about the science of sound, preservice teachers investigated whether noise pollution was an environmental justice issue in Tucson, Arizona, by collecting noise data from various parts of the city, and mapping and comparing those data with other data points like income, race/ethnicity, and tree cover (Schindel et al., 2021). However, I still struggled with the fact that many preservice teachers were often reticent to address these issues in what they presumed to be an apolitical field like science education. While these limitations (Freire, 1970) often felt overwhelming and emotionally draining for me, a white academic in a privileged tenure-track position, I began to see how graduate Students of Color who taught in our programs as well were engulfed in similar struggles, with varying degrees of institutional support, and without the political capital that I had as a tenure-track professor. A couple of the graduate students, for example, had even lost positions as teaching assistants due to complaints from students about the “controversial” content they were teaching.

Though I had always seen myself, ironically, as more of a lone wolf, teaching “against the grain” in mainstream education, it was more or less then that I began to remember the problems and challenges I was facing were much bigger than what one person could tackle alone. Furthermore, as a white woman in academia in a tenure track position, I felt a sense of responsibility to do more than just be a “sympathetic ear.” It was not enough to listen and affirm, or to be “socially and politically conscious.” I needed to take real risks. I think for me, this is the type of reflexivity that we are discussing in this article. Knowing and acknowledging one’s white privilege is not enough to dismantle systemic inequities. Acknowledging one’s white privilege might actually be understood as a non-performative act of allyship—or as Ahmed (2016) describes, “how not to do things with words”—that is, it does not actually change anything about the systems of oppression, such as white supremacy, that produced that privilege. CPP is about doing, not just saying.

So, we started organizing, most of us as the more precarious workers in our department, myself, pre-tenure, and a few graduate students and clinical assistant professors, and a couple of trusted and invited senior professors. We created an equity and social justice (ESJ) committee, which facilitated difficult conversations at department meetings to address the problems that we were encountering, to work toward a more systematic integration of social justice across our programs, policies, and practices (Tolbert et al., 2014). That experience is probably one of the most critical in my early identity development as a science teacher educator, and academic, one that helped ground me in who I wanted to be in the academy—and knowing that it was only possible in solidarity with others.

For me, a CPP for science teacher education has meant seeking out pockets of resistance. What has sustained me in this difficult and often disheartening work, despite feeling frustrated by the enormity of the systemic challenges we face in schooling and teacher education, has been building coalitions, such as the aforementioned ESJ committee, and helping establish the *Science Educators for Equity, Diversity, and Social Justice* research organization—in essence, always “thinking like a movement” (Bharath, 2018) with other teacher educators, academics, and community members teachers (Tolbert et al., 2019). These coalitions were fueled initially by a sense of alienation, of being a lone wolf, but I have since come to realize that that feeling of being a lone wolf can be an impetus for transformative change (Tolbert et al., 2022). It is through the coalitions and solidarities that arose from that feeling that I and my like-minded

colleagues have been able to effectively resist the politics of domestication (Rodriguez, 2006) working to steer us toward conformity and “playing it safe” in science education, higher education, and in K-12 schooling.

4.2 | Unbecoming and dislocation

Sheron Mark

My goals as a critical science educator began to formulate in the biomedical/chemical engineering laboratory and graduate engineering classrooms, but the roots harkened further back to undergraduate biology and chemistry educational experiences and the mathematics and science track in secondary school. I found myself as the only Black graduate student, and the only Black woman, in my research laboratory, as well as most, if not all, of my classes. At the undergraduate level, this sense of isolation was not as drastic, but still palpable—there were few Black students in undergraduate science classrooms and laboratories. I was perhaps buffered from significant feelings of racial isolation and discomfort at the undergraduate level because of a number of factors. These included that I had newly immigrated to the United States for college from Trinidad and Tobago, a twin island nation predominantly populated by people of African and East Indian descent. Thus, I was secure in my racial identity as a Black person. Additionally, my mathematics and science experiences in primary and secondary school were situated within all-girl, academically rigorous contexts. Thus, I was secure in my identity as a high-achieving Black girl in mathematics and science. My undergraduate and graduate science and engineering classrooms now looked and felt different from those in primary and secondary school; however, my progress perhaps reflected stories of “resilience” of Students of Color and Girls of Color in science and engineering in the context of the United States (Ferguson & Martin-Dunlop, 2021; Wright & Riley, 2021).

The challenge with resilience, however, is that it can be unsustainable. Despite security in my intersectional identity as a Black immigrant woman in science and engineering, I was aware that these educational environments were different and implicitly aware that this was inequitable—that some of us were underrepresented, isolated, and situated at the margins of these academic spaces. Students of Color often have to take it upon themselves to make the spaces they inhabit in science and engineering more hospitable and fulfilling as compared to their white peers. They/we must cultivate the resources to sustain themselves/ourselves and persist in their/our educational and professional trajectories. For instance, during my engineering graduate school experiences, I learned of a self-organized community of Black graduate students across disciplines, such as biology, engineering, and economics. These students took it upon themselves to create the resource of community, which was critical for their emotional support, problem-solving, academic preparation, self-care, social connectedness, and more. The availability of this culturally relevant community of Black graduate students helped ease the burden of racial isolation experienced across the various predominantly white graduate programs we inhabited; however, this community existed outside of the formal academic spaces of the university and was created by the students themselves. The critical resources of community and representation for Students of Color in K-12 and higher education science must be established at the institutional level and by educators, as well as made available centrally in science and engineering spaces.

I navigated between the formal academic spaces of my engineering program and critically conscious spaces established by Black peers. My narrow focus on the academic demands of

developing as a scientist/engineer began to wane. In its place, I allowed myself to learn about and acknowledge the experiences and emotions rendered invisible and overlooked, but that can impact one's academic and identity development within science and engineering educational spaces, such as feelings of fit and belonging (Malone & Barabino, 2009; Wade-Jaimes et al., 2021), access to instrumental and social support (Carlone & Johnson, 2007), and systemic inequities in K-12 education that limit the number of Students of Color matriculating into undergraduate and graduate science and engineering programs (Oakes, 1985; Tate, 2001). These experiences initiated the process of coming to critical awareness of the undue burdens facing many Students of Color in engaging and developing fully in science and engineering in academic spaces and then drove subsequent actions to advance critical work by positioning myself within the educational landscape as a science teacher educator. My trajectory reflected that of many other Students of Color in science and engineering who are driven to work toward change and social justice in education upon experiencing or learning about systemic inequities. I write here, as part of a team, encouraging the acknowledgement of the "I" in identity research and teacher education, however, in my own research thus far, this has been difficult. My learned response to systemic racism in the United States has been to minimize or ignore my identity, or at least persist despite my identity; however, CPP allows me the opportunity to reflect deeply, challenge, and move forward differently.

My initial goals as a critical science teacher educator were to engage teacher candidates and practicing teachers in considering issues of race, racism, power, privilege, oppression, identity, and representation in classrooms, schools, and society in relation to their students' experiences and needs in science and in relation to their own work as teachers. For instance, a dominant narrative has emerged in my teaching across both science teaching methods and educational foundations courses. In these courses, many white and economically privileged teacher candidates have tended to essentialize People of Color as being from low-income and traumatized backgrounds. They discuss feelings of pity toward Students of Color and assume that they have challenging home backgrounds, including lack of familial love. Further, they reflect on their own middle- or upper-middle-class backgrounds as resources for which they are grateful and that have protected them from trauma, failing to recognize that trauma can occur at any socio-economic level, among any racial, ethnic, or cultural group, and within family systems that are healthy and loving, as well as dysfunctional. Excavating and challenging these deeply held beliefs in order to inform more productive and humane educational practices requires long-term and iterative engagement and reflection within a trusting community which I have aimed to focus on in my teaching.

Science teacher education that makes the internal work and the implicit hierarchical landscape of science education explicit to both teachers and students requires direct engagement with issues of power, privilege, oppression, and identity. Course experiences must draw out and challenge problematic beliefs and perspectives held by teacher candidates and teachers (Rodriguez & Kitchen, 2005). This work can be uncomfortable, especially as the student body within teacher education programs and the teaching labor force is predominantly white, female, monolingual English-speaking, and from middle-class socioeconomic backgrounds (American Association of Colleges for Teacher Education [AACTE], 2019; Miller, 2017; Schaeffer, 2021). In discussing issues of race, racism, privilege, oppression, and more, and locating these issues within dominant white culture, teacher candidates and teachers from these backgrounds may feel implicated, guilty, or uncomfortable and may respond by directly or indirectly challenging the course material and/or experiences (Mark, 2020). Further, as the faculty within colleges and departments of teacher education are similarly predominantly white and

economically privileged, status quo course and curriculum experiences do not typically reflect robust study of race, racism, privilege, oppression, identity, and other similar topics, especially in the field of science education.

Thus, science teacher educators who engage in this work tend to be seen as unnecessarily disruptive and challenging. They tend to be negatively evaluated by students and receive little support from peers. These experiences are exacerbated when the faculty members are from Communities of Color and, even more so are Women of Color (Turner et al., 2008; Turner & González, 2011). Committing to this work despite the risk and isolation challenges the politics of domestication (Rodriguez, 2006, 2019). In my case, I endured risk and isolation while working toward tenure. Successful promotion and tenure depend upon strong teaching course evaluations. As discussed earlier, course evaluations can be negatively impacted by teaching material deemed controversial or uncomfortable or challenging students' fundamental ideas about themselves or their cultures as liberal and antiracist. Controversial or challenging course content aside, my identity as a Black, female, and immigrant faculty member renders me vulnerable to lower course evaluations by students (Lawless & Chen, 2016; Turner et al., 2008; Turner & González, 2011). However, as within many university systems across the country, tenure review committees do not formally acknowledge these sociopolitical and cultural challenges for faculty members from minoritized backgrounds and who teach controversial or challenging course content. The burden is placed upon the faculty member to argue that context, which can reflect poorly on the faculty member. Thus, many faculty members facing these challenges, including myself, choose to work toward successful teaching and course evaluations as part of their tenure review processes, and commit to being critical in colorblind university settings.

By no means is the focus on issues of race, racism, power, privilege, oppression, and identity reduced or eliminated, but over the course of my beginning years of teaching, I needed to cultivate a set of learning experiences and instructional strategies to strike that balance of reflection, productive struggle, and growth among teacher candidates and doctoral students. I engaged in CPP as I sought to maintain my scholarly and pedagogical commitment to critical pedagogy and to resist becoming subject to the politics of domestication as I worked toward tenure and promotion. For instance, I situate the targeted issues of race, racism, and more in tangible, real-world cases that are both historical and contemporary. I make the cases the focus of students' discussion and reflection in order to use defensible evidence that these issues have existed and still persist, such that students do not easily dismiss these as the agenda of a "difficult" professor. This was particularly important given my visible identities as a Woman of Color and immigrant. Additionally, centering real-world cases rather than hypothetical discussions works to reduce the possibility of students drawing on stereotypes and deep-seated ideologies about People of Color. I also provide students space to reflect on past personal experiences and prior knowledge regarding the targeted topics and invite them to share. This communicates to students that, while we wish to draw out and challenge problematic beliefs and practices regarding racism, oppression, and more, their perspectives as students are not wholly and inherently flawed and are to be changed; but rather we will build upon the productive elements and challenge the problematic aspects. Relatedly, I aim to communicate to students that I am positioning myself to learn from them, as well, and not simply espouse my beliefs to them. It is important for educators to acknowledge that we all possess expertise and strengths that are essential to learning, including our students. This positionality is especially important for educators privileged racially and economically and who will work with many Students of Color given how often Students of Color, their families, and communities are regarded as culturally and academically deficient and without resources that can support learning.

I also vary the ways in which students are exposed to and are asked to engage in considering these targeted issues. For instance, in some cases, I will ask for self-reflection with or without sharing and, other times, I will ask for analysis of cases removed from them personally. In so doing, students do not feel personally challenged and vulnerable at all times. Collectively, these experiences and more work toward establishing a community of trust and authentic engagement focused on challenging topics of race, racism, and more. In course evaluations, many of my students have attested to experiencing safety and trust in learning about these challenging topics. I am more confident that my teaching goals are being realized and that most students expand their perspectives regarding equity, diversity, and social justice. Importantly, these approaches protect me from being depleted when teaching while Black, female, and immigrant. While I have honed and continue to develop my skills in cultivating classroom community and rapport, building trust, challenging students, supporting effective self-reflection and growth, and sourcing and organizing strong curricula, my earlier years of university teaching would have benefited from much greater support and guidance, resulting in less duress and frustration with teaching outcomes. Critical faculty members need support in learning how to effectively teach material in advance of equity, diversity, and social justice just as all faculty members seek support in learning how to teach broadly; however, if “mainstream” teaching resources and support is lacking, “critical” teaching resources and support are even more so. Critical and social justice work in teacher education requires persistence and perseverance and critical teacher educators need support as they develop their identities and positionalities in their own contexts (Bancroft, 2022). CPP could be a useful tool to help identify what resources and actions are needed to support the development of one’s teacher educator identity.

4.3 | Crashing carnival mirrors and seeking to become a Latino science educator

4.3.1 | Alberto J. Rodriguez

My very first experience with racism happened when I was an international student learning English in a small town in southern Ontario, Canada. I and a group of fellow students were participating in an English immersion program as part of our preparation to pursue science or engineering degrees. Our scholarship program was eager to ship us off to various universities across Canada, so the program was intense and high stakes. “Learn English and pass the TOEFL (Test of English as a Foreign Language) or go home.” One morning, as usual, I was on a public bus heading to class, and once again my eyes were fixated on the marvelous capacity of snow to blanket anything and everything. This quiet moment of grace and wonder was suddenly interrupted when two Anglo men, about the same age as me, entered the bus and sat behind me. One of them tapped my shoulder and said loudly, “hey, Paki, go home.” Not knowing what “Paki” meant, I responded as most language learners instinctively do when unable to understand—with a smile and a nod. This only served to infuriate the young men, so one of them got up and sat right beside me. Putting his face closer to me and with an even louder voice, he angrily spewed more hate that to this day I am still grateful that my limited English skills prevented me from comprehending. Puzzled by these men’s actions, I attempted to explain that I was learning English, and politely introduced myself. Not knowing what else to do and honestly curious, I asked them, “what is Paki?” This seemed to catch them by surprise as my Spanish name and lack of English skills did not fit their intended target. They quietly

moved away from me and left me alone after realizing that I was not from Pakistan. However, whatever innocence about the world I had left as a young man studying in a totally different culture was taken away from me that morning when my instructors reluctantly added *racism* as a new vocabulary term for the day. Looking at my hands, I was overwhelmed by the realization that my brown skin makes me an object of hate, and that some individuals can reconstruct and hold hostage my identity because they think their own warped sense of empowerment entitles them to do so.

Unfortunately, for over two decades as a teacher educator and researcher in multiple institutional contexts (including Canada and the United States), I continue to experience various forms of discrimination. One insight I have gained in recent years is that regardless of the titles and achievements you might accomplish, you will often find others who seek to dismiss your identity and attempt to (re)define it as they see fit. These individuals are like carnival mirrors. That is, they construct a distorted and diminished image of how we see ourselves. One salient example of many occurred at my previous institution (Purdue University), and it involved two faculty members who were associate professors at the time. Due to a colleague retiring, an opportunity opened for me to finally teach a science methods course for my department. I have previously taught elementary and secondary science methods courses in monolingual and bilingual contexts for almost two decades at various institutions, so I was excited to work with undergraduates again. The two aforementioned associate professors who often taught the course sent me a copy of their syllabus indicating very directly that this was “the syllabus” (and required textbook) that I was expected to use. I have already been a full professor for many years, and I was hired by this Research 1 institution as a full professor in science education with the Mary Endres Endowed Chair. This meant that I was particularly hired because of my focus on equity and social justice research, and the endowed chair was a recruitment and retention tool this institution used to attract more researchers like me because of the institution's poor record of recruiting and retaining Scholars of Color. Thus, it was deeply disappointing to receive an e-mail that read like a directive indicating the syllabus and textbook I was expected to use unquestionably.

One would have expected that at least out of sheer scholarly curiosity, or at least as a sign of respect for being one of three endowed chairs in the department, a full professor, the only full Professor of Color in the entire department, and the only Latino full professor in the entire college, that these individuals might have wanted to engage in a conversation about what and how I taught science methods courses with a focus on ESJ for the previous 20 years. Sadly, this was not the case.

While I appreciated their effort to share their syllabus, I kindly explained that most of the syllabus and the required textbook directly contradicted most of my research focus and culturally relevant pedagogical approach. I reassured them that my science methods course will provide students with all the basic components commonly associated with pedagogy and curriculum for this type of course, but the core focus would be on equity and diversity throughout. Ironically, for my response I borrowed the same discourse as that of the college's mission which claimed to have equity and diversity as one of its so called “signature” areas. I also reminded them that one of the reasons why I was offered the position with an endowed chair was to help the college advance its equity goals.

My response unfortunately only served to infuriate them and triggered an immediate and aggressive response that was copied this time to the head of our department. For years, as a former teacher and former assistant professor, I saw this intimidation technique play out (Rodriguez, 2005, 2006), but I was surprised to see it at this level as a full professor. In their

response, these individuals insisted that I must follow the syllabus and required textbook “to maintain program integrity.” Again, no indication of scholarly curiosity or even a minor interest of what I could offer to the science education program. There was only the insistence that I comply. Obviously, I unreservedly refused. Out of courtesy, and still hoping to instigate some scholarly curiosity, I explained that the textbook they were suggesting was 15 years old and set in a British school context. I also did a frequency count of key terms in the textbook’s most recent edition. I found that essential terms relevant to my research and teaching, such as equity, diversity, Latino/a, African American, Black, First Nations, Indigenous Peoples, LGTBQ+, social justice, and so on, were not found at all, or barely present. I also explained that the principle of academic freedom granted me the right to teach the course as I deemed most appropriate according to my expertise, and that again I will integrate the basic elements all methods courses should cover (after all, I should know after teaching similar courses for two decades earlier across the United States). Also, ironically, while this was happening, the concept of academic freedom was being discussed by the University Senate’s Equity and Diversity Committee—a committee that I helped establish and became its first Chair. But, again, using my experience, knowledge, and desire to advance the equity goals of the college/university was not the goal in this exchange. The goal was to (re)define my identity and “put me in my place” through *the politics of domestication* (Rivera, 2022; Rodriguez, 2005).

As explained earlier, the main objective of the politics of domestication is to subdue, silence, and dominate the perceived other to maintain the status quo and reaffirm existing oppressive power structures. Using reflexivity as tool to recognize and respond to these politics of domestication, I took steps to reassert my own identity as a Latino science educator committed to carrying out the job I was hired to do in the first place. These steps are what we are describing as CPP in this manuscript.

Returning to the politics of domestication process I was experiencing, the aforementioned e-mail exchange with the two associate professors resulted in the summoning of a meeting with all the science education faculty and the Department Head. While I thought that was going to be a great opportunity for the Department Head to remind everyone why I was hired and the need for the department/college to advance its so called “signature areas,” which included addressing equity and diversity, I was once again more optimistic than the politics of domestication indeed allowed.

In short, this meeting turned out to be a poor performance of what it seemed a previously rehearsed play, as it was obvious that the Department Head had already been consulted and, as usual, this individual had already picked whatever path appeared safer. As an example of how well this meeting (play) went, when I explained to the Department Chair how the textbook I was being required to use negated almost everything I have been working on as science educator for the last 20 years, the Chair responded that “it was just a professional courtesy” to adopt the textbook as required. That was a stunning response and a nonchalant dismissal of academic freedom. Again, I utterly rejected to comply, and once again reminded everyone that the purpose of hiring new faculty—and especially Faculty of Color—with unique expertise is not to have their knowledge and experiences negated so that they just blindly conform to existing discursive practices (i.e., comply to the politics of domestication). Ultimately, the predominant and symbolic message I was receiving in response to my arguments at this meeting was that I should just behave as a *brown skin mannequin*—to be seen and not heard, and to be used for display only in the college/university’s “diversity showcase.”

My push back against the politics of domestication came of course with the traditional price Faculty of Color must pay when they dare to dissent (Cochran, 2018; Hartley & Ball, 2019). I

was ostracized and the word soon spread out that I was not “a team player,” which is another micro/macroaggression used in efforts to domesticate Scholars of Color (Rodriguez, 2009). Every effort was made to “encourage” me to leave. However, even though I did want to leave such an intellectually suffocating environment, as one of the few full professors of color in the entire college, I felt I should leave only after I have done enough to expose the politics of domestication occurring within my department/college and university in general. Thus, as part of my CPP (or planned efforts for transformative action) for the almost 10 years I worked at this institution, I continued to teach and do research in my science methods courses with a focus on ESJ; I helped reactivate the college's equity and diversity committee and chaired that committee twice; I led the establishment of the University Senate Equity and Diversity Committee and became its first chair. I also became the first Latino to ever be elected Chair of the University Senate in the university's 150 years history. There is more to share, and I had a great deal of success working with colleagues outside my college and from across the university in various efforts to promote equity and diversity. The results of one of those projects were published recently in the *Innovative Higher Education* journal (Rodriguez et al., 2021). After being selected for my college's *Equity, Diversity and Social Justice Award* in 2020, I deeply felt the irony of receiving such an award from a college so slow and recalcitrant to change, and while I was associated with a department where I continued to experience the worst forms of micro/macroaggressions I have ever encountered throughout my career. It was now a good time to leave on my terms ... and I did.

These experiences as a science teacher educator have reinforced for me the importance of helping educators develop a strong and more pragmatic concept of identity. To this end, CPP is a tool for interpreting how our experiences and interactions with others serve to advance or obstruct our chosen identity(ies), as well as a tool for operationalizing how we choose to respond to affirm our own sense of self.

5 | CONCLUSION AND RECOMMENDATIONS

We have outlined how CPP can be a heuristic for analyzing how our identities are informed by our own racial, gendered, and other sociopolitical characteristics—as well as how others perceive us in relation to those characteristics. Each of us has described how the ways we see ourselves have changed through the racialized and/or gendered ways others see us. Within this dialectical relationship (how we view ourselves and how we are viewed by others), we have identified opportunities we have taken toward effecting change and rejected politics of domestication. Central to our understanding of CPP, therefore, is its potential as an agentic tool. Alberto has described how his Latino background and brown skin are racialized by others, both by those who are blatantly racist as well as by those who want to use his identity mainly as marketing material to promote the diversity of the institution. Aware of these dynamics, he works against the politics of domestication to hold the institution accountable through practices of dissent/refusal (e.g., refusing to drop the social justice focus of his science methods course and refusing to adopt an outdated textbook as a “courtesy” to his white colleagues). In addition, Alberto sought to enact CPP through transformative participation in university politics (e.g., organizing equity and diversity initiatives and committees that work toward real institutional change). Sheron described how, while secure in her own identity as a Black woman in STEM, she is made vulnerable by the institution's use of course evaluations in tenure and promotion. Course evaluations disproportionately discriminate against Peoples of Color and women, and particularly Women of Color, who are impacted by the racist and sexist biases of

students completing the evaluations. Rather than feeling hindered or domesticated, however, Sheron, conscious of how her identity is perceived by predominantly white students, finds creative and subversive ways to educate students in STEM for social justice and anti-racist practice. CPP also enables Sheron to analyze how her own response to systemic racism in the United States has sometimes been to minimize her identity, avoiding the “I,” for example, in research—a revelation that allows her “to move forward differently.” Sara, cognizant of the inherent privilege in whiteness, seeks to build communities for transformative action within and outside of the institution. She looks to foster collective agency around issues of anti-racism and social justice, so that individual academics (and particularly individual academics of color) are not forced to go at it alone—and can together work against the domesticating forces of the university and the profession.

In this article, we have argued that identity research must attend with more complexity to the notion of the “I” as it pertains to the researcher’s positionality in identity research. Our primary focus in this manuscript has been on racialization and racism, as these were central to our experiences as teacher educators and identified as key themes across our autoethnographic reflections. However, we view CPP as a framework that can support transformative reflection and action along multiple and intersecting issues of oppression and marginalization, such as able-ism (Boda, 2020), or heteronormativity (Davies & Neustifter, 2023). Drawing from our own autoethnographies as science teacher educators, we have sought to make explicit the way that a CPP framework (and mindset) supports a more reflexive and transformative engagement with the notion of the “I” in identity research. We have further highlighted the need to more closely study the role that dissent plays in identity development; that is, how communities and individuals work against the politics of domestication and the identities constructed for them by others—and in through the process of dissent, communities and individuals are always becoming—shaping and reshaping their sense of self.

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