Critical Race Theory for HCI

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ABSTRACT

The human-computer interaction community has made some efforts toward racial diversity, but the outcomes remain meager. We introduce *critical race theory* and adapt it for HCI to lay a theoretical basis for race-conscious efforts, both in research and within our community. Building on the theory's original tenets, we argue that racism is pervasive in everyday socio-technical systems; that the HCI community is prone to "interest convergence," where concessions to inclusion require benefits to those in power; and that the neoliberal underpinnings of the technology industry itself propagate racism. Critical race theory uses storytelling as a means to upend deep-seated assumptions, and we relate several personal stories to highlight ongoing problems of race in HCI. The implications: *all* HCI research must be attuned to issues of race; participation of underrepresented minorities must be sought in *all* of our activities; and as a community, we cannot become comfortable while racial disparities exist.

Author Keywords

critical race theory; race; racism; storytelling; theory

CCS Concepts

•Human-centered computing → HCI theory, concepts and models;

INTRODUCTION

Recent events in the United States have prominently surfaced issues of race and ethnicity: a rise in hate crimes targeting people of African, Arab, Asian, Jewish, and other origins [36]; a growing list of Black citizens killed by police officers [62]; the response through the establishment of the Black Lives Matter movement; the 2017 White supremacist rally in Charlottesville, VA. Meanwhile, public sentiment toward technology has turned more critical with concerns about data privacy [123], dissemination of 'fake news' [31], election meddling [131], exacerbation of inequality [49], and other issues instigating employee protests [81], Congressional hearings [79], and fines for technology companies [126].

These trends intersect in a way relevant to human-computer interaction, and HCI scholars have responded with several papers highlighting race. For example, in a 2016 paper, "*Does Technology Have Race?*" Hankerson and colleagues enumerate a number of digital technologies that have different consequences for people of different races [63]. In 2018, Schlesinger, O'Hara, and Taylor consider the complexities of avoiding racism in chatbots, with conclusions that have broader scope [110]. Even more recently, O'Leary et al. explore how "conventional design practices may perpetuate forms of institutional racism," and suggest an alternative that emphasizes pre-existing forms of creativity [92].

It is not that racism has reappeared, as much as that ongoing racism – that never went away – is currently receiving more visibility. While this bump in interest is welcome, public attention is fickle. Any community hoping to eliminate racism must sustain attention, resources, and effort toward meaningful change. And here, too, the HCI community has not been idle. Its special interest group, SIGCHI, has buttressed efforts toward greater inclusivity through an appointed chair [42], a series of Diversity & Inclusion lunches [20], and so on.

Yet in spite of such efforts, the inequitable consequences of racism are severe even in a community like ours that often considers itself to be socially progressive. For example, of the 133 current members of the CHI Academy – those recognized by our community as having made substantial contributions to HCI – 124 (93%) appear to be White[1]. Only 9 appear non-White: 5 of East Asian descent (3.8%), 2 South Asian (1.5%), 2 Latinx (1.5%), and 0 Black/African descent. These numbers are far from reflective of the global or U.S. proportions of these groups, and they are less diverse than, for example, leadership at companies that have been criticized for poor diversity [69].

As one step toward greater inclusivity, we propose that HCI scholars and practitioners engage more substantially and consistently with *critical race theory*, both as a way to advance inclusive research, but also to reduce our community's own racial disparities. Critical race theory is a theoretical framework introduced in the 1970s by legal scholars to challenge the dominant discourse on race and racism [34]. Particularly for an intellectual community such as ours, maintaining a focus on race requires not only the formation of institutions and processes, but engagement with relevant theory. Critical race theory offers a starting point for such theoretical engagement, and in this paper, we introduce and adapt several of its key tenets for the HCI community: the ordinariness of racism; the social construction of race; interest convergence – the idea

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[1]We arrived at these numbers by inspection of websites and CVs (a methodology we do not advocate for determining race in general). Self-identified racial tallies may differ, but are very unlikely to invalidate the larger point being made.

that those in power support progressive goals only when it serves their selfish interests, as well; the intersectionality of identity; a critique of liberalism; the uniqueness of voices of color; and methodologically, storytelling as a means to explore oppression. Some of these ideas will be familiar to readers, but critical race theory imbues them with an urgency and significance that go beyond common understanding.

We contribute the following HCI-focused adaptations: racism is pervasive and ordinary in our society's digital platforms and the larger socio-technical systems in which they are embedded; interest convergence is at work even in the HCI community; storytelling is an effective means of elevating stifled racial voices in HCI; and, the technology sector's color-blind tendencies – based on both liberalism and market capitalism – reinforce racist disparities. To demonstrate critical race theory's key method of *storytelling*, we include our own personal stories from HCI and academic contexts, and use them as a basis for adapting critical race theory to HCI. Our contributions have implications for both HCI research and for the HCI community itself. While a number of previous HCI papers mention "critical race theory" or interact substantially with race, this paper offers the first in-depth engagement with the theory in an HCI context.

For the authors, these issues are inextricably personal, and we incorporate reflexivity on our own positions as HCI researchers. We come from different positions of privilege and marginalization. Collectively, we are U.S.-based researchers at R1 universities and all people of color (including authors from African-American, Asian, mixed-race, and multicultural backgrounds). As our personal stories will reflect, we have had a range of experiences navigating issues related to race. For example, many of us have done research that directly impacts or focuses on racially marginalized populations, both in the U.S. and internationally. We also recognize that there are many intersections of race and marginalization that we do not experience. For example, we are all cisgender individuals. Our experiences cannot and do not represent everyone who shares a particular identity. We hope to speak to communities we do belong to, namely HCI researchers and practitioners.

We acknowledge one limitation of this paper up front: we consider race primarily in the context of the United States, neglecting the vast issues of race and ethnicity in the rest of the world, as well as the role of race in U.S. foreign policy. In part, this is for lack of space – we can hardly do justice to the complex matters of race and HCI just in the United States in a single paper. Additionally, critical race theory has its roots in U.S. legal theory. However, we hope that this paper will nevertheless spark necessary conversations about race and ethnicity in HCI beyond U.S. contexts.

The main contribution of this paper is theoretical, but as with critical race theory itself, it is also a call to action. We begin with definitions of race and racism and offer a brief overview of critical race theory. After reviewing relevant research, we offer personal stories that highlight problems and challenges with respect to race and HCI. We then adapt some of critical race theory's main tenets for HCI. Finally, we offer actionable implications for HCI research and the HCI community itself.

CRITICAL RACE THEORY: BACKGROUND

Race and Racism in the United States

Race-based disparities in the United States are firmly established (figures from 2016-2018 data): Median incomes for Blacks, Hispanics, and Native Americans are about 65% of White income [74, 135]. The median Black and Latinx families own 2% and 4% the median wealth of White families, respectively [27]. Rates of college degrees among adults 25 years and older are 54% for Asians, 36% for Whites, 22.5% for Blacks, and 15.5% for Hispanics [108]. Blacks are six times more likely to be in prison than Whites, Hispanics are three times more likely [21, 57]. There is no end to such statistics.

These inequities have historical roots embedded deeply in our legal and economic institutions. Slavery in America goes back to 1619 [122], a century and a half before the country's founding. The country's constitution, ratified in 1788, counted slaves as three-fifths of a person and denied them a vote [28], a situation that continued until the 14th Amendment, passed in 1868. After slavery was abolished, legally enforced racism continued with oppressive Jim Crow laws [73], voting laws [50], and redlining [12]. By 1970, equality was legally assured, but not protected or enforced in practice (e.g. [29]). More recently, executive orders shifting immigration policies specifically target persons of color: travel bans for citizens of some majority-Muslim countries, non-renewal of the Deferred Action for Childhood Arrivals (DACA) program, and attempts to end Temporary Protected Status for certain nationals [100].

Race is difficult to define, and its definition remains contested [25, 107, 112, 133]. Race is multi-dimensional and, at different times, may refer to: phenotype/physical features, observed classifications into distinct groups, individual notions of self-defined identity, and racial ancestry [107]. For the purpose of this paper, we refer to race as a categorization that is socially constructed, but that involves material and concrete consequences [82]. In the contemporary U.S. context, common racial categories are Asian, Black or African American, Hispanic or Latinx, Native American, Pacific Islander, and White, but these categories are neither fixed nor exhaustive. In any case, the theoretical contributions of this paper apply for a range of definitions of race, and to the extent that our aim is to reduce prejudice and inequality, progress depends less on a precise definition of race as on actions to end discrimination.

Racism comprises attitudes, actions, and institutions which contribute to relative disadvantages for members of racial groups with comparatively less power. It ranges from overt acts such as hate speech and violence to systemic exclusions, prejudices, and biases to subtle, even unconscious acts, such as aversive racism and microaggressions [34, 39, 40, 88]. Color-blind racism, for example, enables racism through claims of ignoring race: "I don't see color, just people" [14]. Racism can be perpetrated by individuals, groups, and institutions, either intentionally or unintentionally [34].

Key Tenets of Critical Race Theory

Responding to race-based material disparities that persisted in the United States even after 1960s Civil Rights legislation, legal scholars and activists in the 1970s developed critical race

theory as a framework to challenge the deep-rooted philosophical, legal, systemic, and practical causes of racism [34, 41]. As the name implies, critical race theory has intellectual roots in critical theory, which examines the role of power, history, culture, and ideology on social phenomena, often with an eye to critiquing or correcting abuses of power [72]. But, critical race theory's laser-focus on matters of race has led it to develop its own language and concepts. While critical race theorists do not subscribe to a unified set of principles, several key tenets are prominent in their writings:

- **Racism is ordinary, not aberrational [34, 117].** Those who rarely encounter racism themselves often think of racism as an occasional happening – that a minority of individuals are racist, and racist events are one-off occurrences. But, racism is pervasive, ever-present, structural, and systemic. Those who experience it do so on a regular basis in a variety of forms with a range of severity. Racism is often embedded in institutions and practices. Those who propagate it often do so unknowingly and without conscious negative intent. To productively discuss racism, its hidden ubiquity must be exposed and acknowledged.
- **Race and racism are socially constructed [34].** Race does not represent biological or genetic truths. Instead, racial categories and societal behavior with respect to them are entirely human-made. (This is not to say that physical characteristics have no genetic basis, but that the categories used to differentiate and divide groups of people are artificial. History shows that racial categories are fluid [16]).
- **Identity is intersectional [30].** Each person represents a unique and even potentially conflicting set of overlapping identities. In order to discuss and dismantle racism, we must be anti-essentialist and incorporate an understanding that these intersecting identities create unique contexts.
- **Those with power rarely concede it without *interest convergence* [9, 8].** Racism benefits some groups, and those groups are reluctant to move against it. They will take or allow anti-racist actions most often when it also confers them benefits. In the U.S. context, forward movement for civil rights has typically only occurred when it is materially in the interest of the White majority.
- **Liberalism itself can hinder anti-racist progress [34].** Liberalism's very aspirations to color-blindness and equality – while admirable – can impede its goals, as they prohibit race-conscious attempts to right historical wrongs. In addition, liberalism's tendency to focus on high-minded abstractions can lead to neglect of discrimination in practice.
- **There is a uniqueness to the voice of color [33], and storytelling is a means for it to be heard [112].** Belonging to a racial minority or an oppressed racial group endows one with a unique perspective, especially with regard to race and racism. Counterstories can challenge and displace dominant narratives, which are broadly held, consciously or unconsciously.

Since the 1970s, critical race theory has expanded into subfields such as LatCrit, queerCrit, AsianCrit, and Critical Race Feminism, as well as into other disciplines such as education, women's studies, and public health. As a lens, critical race theory illuminates hidden forms of racism and their origins, offers supportive evidence, rhetoric, and community for victims of racism [38], and provides an intellectual foundation for anti-racist activism.

RELATED WORK: RACE AND HCI

There has been a recent surge of publications about race and digital technology. They highlight negative representations of racial minorities [3, 89], reveal racist applications of technology [10, 22], celebrate the unique use of technology by specific racial groups [10, 19, 87], and showcase ways to fight racism [11, 83]. Much of this work notes how offline racism is reflected and reinforced online [10, 89]. But, much of this work remains high-level without engaging with HCI-specific issues; little of it is by HCI authors or in HCI publications, despite our community's 30+-year history [111] and 14,000+ research articles just at CHI [109]. A Google Scholar search with search terms "racial* AND (discrimination OR bias OR prejudice)" finds 120 articles in CHI Proceedings, less than 1% of the total. In a more rigorous 2016 search, Schlesinger et al. [109] found 17 articles specifically addressing race (as opposed to, say, merely breaking down research participants by race). No more than 9 CHI papers include the phrase "critical race," and all such mentions are one-off, without much engagement with the associated theory. Most race-focused HCI papers were published after 2000, with many of them appearing in the past few years. Given the paucity of race-focused papers in HCI, we focus our literature review on (1) research that directly engages with or focuses on specific communities of color, (2) research that engages with racial bias in technology, and (3) theoretical work that aligns in some way with critical race theory.

Work With and About Communities of Color

HCI researchers have investigated or designed for small communities of various kinds. Some of this work has engaged with communities of racial minorities, focusing on issues such as health or community engagement [29, 48, 58, 66, 84, 85, 116]. More often than not, this work engages only briefly with race, but sometimes it focuses on what is unique or different about a race-based group. Grimes and colleagues, for example, have consistently articulated the importance of cultural relevance and within-community role models in information sources for low-income African American communities [58, 59].

A frequent outcome of this category of research are reflective lessons on how to conduct research with such communities. For example, Stowell et al. [116] mention the importance of noting racial demographics and intersectional issues in work with participants. Le Dantec & Fox [78] discuss the steps necessary to conduct research with non-majority communities, from gaining access and building rapport, demonstrating commitments, and overcoming institutional and personal barriers to design research to allow participants to fundamentally guide the research and approach. They also note the importance of acknowledging the authority and power that extends to being a researcher, which may reduce the voice of the disempowered. Baumann et al. [7] and Harrington et al. [64] employ similar

practices to illuminate underserved populations by using physical space and settings to serve as a collaborative dialogue. Relying on Participatory Action Research and Community-Based Participatory Research focus the participant as political collaborator and catalyst for change [129]. Both contextualize their work by highlighting their results and subsequent technologies that are tied to their participants' cultural practices.

Indeed, there are occasions when insufficiently thought-through work that seeks to illuminate communities of color can have unintended negative effects on broader conceptions of race [139, 140]. For example, one study offers a comparison of technology use between two communities, one of low-income African Americans and another of wealthy White Americans [140]. The paper highlights discrepancies in use and attributes them primarily to socioeconomic class, but the word "race" is prominent in the title, and some findings are attributed to race and other intersectional identities. Putting aside the question of whether such attributions are valid (given the groups differed on multiple dimensions), the choice of the groups itself is questionable: The choice makes it difficult to draw inferences other than those based on stereotyped correlations of race and income. Erete and others [48, 47] incorporate race more sensitively, by using race as an element in selecting communities to work with, but with more nuanced attributions of community differences.

Most of the work above, however, sees race as a characteristic of the researcher or the participant group that must be considered in design. Rarely does it go further into the broader context of race and technology. Critical race theory builds on the reflective content of these papers, while also providing a larger frame and historical context. It also argues that researchers have a responsibility to be aware and sensitive to issues of race when engaging with communities of color.

Bias in Technology and Design

Much of the critique of biased technology focuses on algorithmic bias – systemic errors in computer systems that lead to unfair outcomes or judgements. Some algorithmic bias is explicitly about the physical dimensions of race. Some systems do not recognize darker skin tones [23, 54, 93]. Autonomous cars have been found to mis-identify darker-skinned pedestrians 10 percent more often than lighter-skinned subjects [67, 134]. Commercial facial recognition technology has been found to be more accurate for White faces than for Black faces [102]. These algorithmic errors have real-world consequences as the technology is increasingly used by law enforcement [75, 77].

Other forms of algorithmic bias creep in through flawed training data that is itself biased, whether for historical reasons, flawed human labeling, or otherwise [5, 89, 106]. Modern online ads are individually targeted, but often based on race-based correlations; corporations often excuse such biases on the basis that the bias was in the data [118]. Relatedly, researchers have also examined the ways in which the design of technologies may amplify racial stereotypes (e.g., [47]).

HCI researchers have begun to respond to these problems. Hankerson et al. offer a list of discriminatory technology and discuss the normality of technological racism [63]. Schlesinger et al. consider the challenges of eliminating hate speech in chat bots [110]. A few papers have examined how racial bias might be mitigated with technological interventions. For example, virtual reality has been used to explore how embodying avatars of a different gender or race impacts implicit bias [80], and transfer of negative racial stereotypes has been studied in virtual game environments [94]. At a meta-level, Woodruff et al. examined how people from marginalized groups perceive algorithmic fairness and found that teaching about notions of bias in algorithms incited negative emotions and connections to contemporary concerns about racial justice [137]. Others argue that conventional design practice has not adequately accounted for race or for the effects of racism [18, 51]. Treating race as a discrete variable in the design process often overlooks structural effects of race on design outcomes.

Critiquing and examining racial bias in technology is an important first step, but we have much further to go. Technological racism is not limited to face recognition and biased algorithms. Race should not be relegated to a niche topic in HCI.

Allied Research

A number of movements, frameworks, and theories in HCI have goals allied with critical race theory, in that they seek to address injustices faced by minority, vulnerable, or marginalized communities of various kinds.

Among the most salient such efforts are those that have a common intellectual ancestor in critical theory – for example, feminist HCI and queer HCI. Feminist HCI examines the "design and evaluation of interactive systems that are imbued with sensitivity to the central commitments of feminism – agency, fulfillment, identity and the self, equity, empowerment, diversity, and social justice" [6]. Queer HCI articulates the need to focus on the "structures and norms that underlay sexism" and acknowledges the diversity within the LGBTQIA community [113]. The theorizing behind these and related movements extends to larger issues of oppression and injustice, and their conclusions often apply to issues of race, as well.

A related set of theories incorporates race as one of many dimensions of discrimination or inequality. Ekbia & Nardi, for example, discuss the systemic causes of inequality, and call for the HCI community to ask such questions as "Which social class benefits from this technology, and might be there a way to work toward balancing benefits for different social classes more equitably?" [45]. Kimberlé Crenshaw, one of the pioneers of critical race theory, coined the concept of *intersectionality* to refer to contexts in which those with multiple discriminated identities – e.g., female and African-American – fall through the cracks of attempts to address injustices suffered by individual identity groups. The concept has since been broadened to consider the complexities of overlapping identities, and it has also been imported into HCI [103, 109]. That work shows that research on race and ethnicity lags behind research on gender and socio-economic class within the HCI community.

HCI also has a longer engagement with universalist frameworks, in which the goal is to design technological artifacts

that work for everyone. Explicitly or implicitly, these frameworks suggest that any designs that disadvantage any particular group are poorly conceived. Examples include Universal Design [114] and Value-Sensitive Design [53]. Like Enlightenment liberalism, these theories tend toward color-blindness and share both its strengths and weaknesses: On the one hand, they argue for design to accommodate all groups; on the other hand, they are largely mute on questions of how to counteract accumulated biases that affect specific groups. Overall, theories that recommend strategies to address large populations often fail to incorporate or interpret inequalities, history, privilege, and power and their impacts on people [35].

We are aligned with these theories in that we share a commitment to ending discrimination of all kinds. We are also wary of the potential for race concerns to be diluted under the increasingly overburdened umbrella of "diversity." Critical race theory offers a theoretical basis on which to anchor issues of race. As a group, we should be arguing to increase the pie of inclusion efforts, not simply creating ever-shrinking slices.

PERSONAL STORIES

In this section, we relate personal stories related to race and HCI, both as data that we synthesize in our later adaptation of race to HCI, and also as an illustration of storytelling as a potent methodological tool in critical race theory. Critical race theory sometimes ventures into fiction [9], but all of the stories here are real. Effort has been made to provide concrete details wherever possible, but names and some circumstances have been obscured or omitted to provide the narrators or their subjects anonymity. We also switch to first-person singular pronouns here, as they are individual stories told by one of the co-authors; the first-person also serves to emphasize the stories' specificity and personal impact.

Story 1: Different Views on Filter Bubbles

I attend a predominately White, private R1 university. In my second year as a Ph.D. student, I took a theory-based course about Human Computer Interaction, a chance to dive deeper into the discipline and community in which I was striving to become part. Despite the flood of information on landmark papers, the conversation around filter bubbles surprised me most. Filter bubbles create states of intellectual isolation [46] that can occur from personalized searches resulting in the website algorithms predicting what users want to see based upon their location, click behavior, and search history [4, 32].

The realities I face as an African-American woman went unknown to my White counterparts, simply because their Internet history filtered it away. All the Black lives lost and criminalized – White readers are likely familiar with the stories of Trayvon Martin, Eric Garner, and Sandra Bland, but what about Sean Bell, John Crawford, and Tamir Rice? What is an occasional news item for the majority is a continual stream of tragedy for others. Unless mass media highlighted these deaths, their presence and subsequent effects were minimized and felt by few. We discussed in class the need for filter bubbles and how it made navigating the Internet convenient, a stance I could not get behind. It served as another example in which I felt silenced and that my presence did not matter.

Story 2: Editing Away Voices of Color

I wrote a paper that focused on interviews with people of color and received comments from my reviewers to severely edit the direct quotations I included from my participants. I rely on large block quotations from participants so that in addition to reading my analysis, readers can hear stories directly from the voice of my participants. I was uncomfortable being asked to edit my quotations for "grammar" and "readability." Many of my participants used colloquial language. As a researcher developing rapport with my participants, the use of vernacular English signals a certain level of trust or at least comfort. To me, making the quotations "proper grammatically" is an ivory-tower, elitist, racist erasure of voices of color. As one reviewer urged, "I usually edit quotations and remove words to make them more easily readable." My reviewers asked me to force my participants to conform to elitist, White notions of proper language without their consent.

In addition to the affront to my participants, this feedback encodes a subtle and concrete threat to my own career. Reviews occur behind closed doors through anonymous systems. The implication is loud and clear – conform to our standards. Clean and polish the language or face roadblocks in your career. Many of my friends and I are people of color who use informal, vernacular language and many of my colleagues speak English as a second language. Now I have to question and evaluate others in HCI to judge whether they will limit my opportunities or unfairly judge my ability if I do not consistently use the language of elite Whites. The feedback in these reviews signals backstage racism (i.e., racist opinions only expressed in seemingly safe or anonymous environments [99]) in the academy, adding cumulative stress, anger, and paranoia to my daily experiences as an HCI researcher.

Story 3: Interpreting Voices of Color

My first research study in my doctoral program involved my current work with homeless youth. It was not until after the first focus group my colleague and I co-facilitated that I had to reflect on the various roles I played. The two of us were, in some ways the same – highly-educated, cisgendered women. We had never experienced homelessness, or having to come to terms with being truly out on your own without any type of support. Where we did differ, however, was race – my co-facilitator is White whereas I am a Black woman.

We experienced many and differing forms of privilege. For instance, when trying to simply build rapport with the youth, we discussed things to which they look forward. One of the participants mentioned how he simply looks forward to going to a full time university because he has exhausted by all the computer science credits at his local community college. But right now, he just does not have the money. I stood confused on how to respond. Having never had to worry about my education highlighted my own potential unawareness in engaging in research with someone from a vulnerable population.

When my co-facilitator and I collected data separately in follow-up interviews, we found that our primarily Black participants tended to provide longer and more detailed answers when I led the interview. It's hard to definitively pinpoint it

to race; however, it is worth noting that is the component that most obviously differentiated us.

Finally, in data analysis the difference between my co-facilitaor and I became even more pronounced. In open coding and thematic discussion, my co-facilitator noted that some of the participants comments went completely over her head. It became clear that because of my cultural background and familiarity with the vernacular, I was able to recognize and interpret the participants' more racially coded remarks into our findings. While I am satisfied with our work, I realized if I had not been present, many of their comments may have gone unnoticed. A marginalized population would have still remained voiceless through naive interpretation.

Story 4: Acknowledging Race in Research

This story presents two perspectives: PhD advisee and advisor.

The Student's Story. My recent research focused on returning citizens (individuals who were formerly incarcerated) which requires an acknowledgment of race [91]. The majority of my participants were African American and not mentioning that leaves out important context both for these individuals and for the larger history of the judicial system that put them in prison. Racial minorities have been imprisoned at disproportionate rates in the United States since its inception [1, 55], whether it was to uphold slavery, or Jim Crow laws that placed many African Americans in prison, or laws inhibiting African Americans' ability to vote [97, 127]. Additionally, my research took place in a majority African American city that has its own racialized history. At the same time, I was concerned that acknowledging race in an HCI research paper could just as easily amplify a racist stereotype amongst the HCI community that people of color are criminals.

Colleagues told me that my readers – members of the HCI community – would be aware of this historical context. Nevertheless, I was disturbed that there was no space to unpack the implications of race in my work on returning citizens. I, myself, was also absorbing a lot of new information while conducting the research. I was disappointed that page limitations were hugely part of the reason I could not go deeply into race. Knowing how biases such as confirmation bias and implicit bias operate, the lack of racial minority representation within HCI spaces heightened my concern that my work would unintentionally confirm racist prejudices.

The HCI community is a global community filled with individuals who identify as researchers, practitioners, and more. In addition to this, our research should be approachable to the general population. I was forced to trust reader's good will, as well as their general understanding of the racial dimension of the justice system in America, without much justification. Why is it safe to assume that we are all highly attuned to the news and politics of all the countries where we perform HCI research? Does the assumption of being educated mean individuals cannot be ignorant, racist, or hold other prejudices?

The Advisor's Story. When my advisee asked whether we should mention race as we engaged on the paper, I clearly recall recommending a "race-blind" approach. My reasoning at the time was (1) that it was much easier to write the paper that way for constraints of space, time, and literature review; (2) that race was only tangentially relevant to the core theme of the paper; and (3) that I expected the well-educated HCI audience to be aware of the historical biases of Black incarceration in America. Thinking back on it, though, the real source of my reluctance was that I knew introducing race in the paper would require considerable time to frame well – and we did not have the time. Even without that effort, we were cutting it close to the deadline. My bigger priority was to ensure that my advisee – herself a person of color, for whom the best thing I could do was to support her growth as an academic – could submit a research paper. But, that is not an excuse. The trade-off was required only because we had not thought through the issues much earlier. Black people are overrepresented in American prisons, and that is the result of years of accumulated racism in the country [55]. Yet, none of that was ultimately indicated in our paper, even in a footnote. It was a missed opportunity to offer context and corrective narrative about race in a research paper whose topic was inextricably intertwined with it.

Story 5: Everyday Privilege

A Black colleague and I used to collaborate closely on a project that required us to drive about an hour from our offices. My collaborator and I took turns driving, and sometimes, she would remark on how fast I drove. I regularly went over the speed limit, but I generally stayed within 10% of the posted speed – a margin I assumed everyone took advantage of. She repeated the remark over the course of the project, and it dawned on me that maybe, driving over the limit was a privilege that I – an Asian person – took for granted.

The news in the United States is full of Black men being killed after routine traffic stops [62]. One study finds that African-Americans are about twice as likely as Whites to die of police violence, while Asians are 50% less likely [44]. Could it be that to be safe, some African Americans drive strictly within the speed limit to reduce the chances of a police pull-over? If that was what my colleague was doing, she could be losing an extra 15 minutes per trip when she travels solo to the field. That could add up to hours, days, even weeks of lost research productivity over time, which would cause a systematic race-based disparity among researchers. These thoughts caused me to realize in a newer, deeper way, just how insidious and hidden racism can be: How it cascades through tortuous chains of causality. How it pervades every little mundane aspect of life. And how even if there were no direct racism in HCI, per se, there would still be the negative impact of racism.

Story 6: Who Benefits from Diversity & Inclusion?

In 2014, Google published demographic data about its employees for the first time [69]. At the time, only 2% of Google's U.S. workforce was Black, and 3% Hispanic, and the numbers in leadership and in technical positions were even lower. Google's then Senior VP of People Operations, admitted, "We're not where we want to be when it comes to diversity" [69]. But, as poor as the numbers were, commentators still praised Google for their transparency [69, 132].

But, other forces might have been at play. The increased visibility for data-intensive approaches to HR likely helped

that executive to raise $40 million to start his own company [130]. He left Google in time to avoid several diversity-related scandals, among which were revelations in 2018 that racial diversity had seen very little change in four years: representation of Blacks and Hispanics at Google U.S. had only risen by 0.5%-0.6% since 2014 [90]. All of this to say that leaders who contribute to diversity efforts are often rewarded, even as they miss the inclusive targets they claim to seek.

I have noticed similar phenomena in academia and even in my own career. My university recently made dramatic investments to improve diversity. Yet, its own analysis of faculty diversity finds that rates of minority representation have barely budged over the last decade. Several years ago in my department, faculty performance reviews added a section on individual contributions to diversity. Each year, I dutifully indicate a range of activities along these lines, though without measures of actual impact. I will likely continue along the expected professorial trajectory, even as racial injustices around me remain inadequately addressed. Even at CHI, recent leadership positions of the various diversity and inclusion efforts have been majority White [20, 42], and racial minority representation at the conferences remains low.

I believe most of the inclusion efforts above to be in earnest. But, the outcomes continue to be disappointing. As knowledge workers, we take pride in being an impact-focused meritocracy, but with respect to racial equity and inclusion, we regularly overlook our failures. The struggle continues.

Story 7: University Public Relations

I volunteered as an organizer for a racial justice conference in my city. This was done on my personal time outside of the university structure. Before the conference, I was interviewed by a university press representative, and afterwards the interview was posted to the front page of the university website for two weeks. The article applauded the students involved for being active in the community. However, the university had provided no support for the time, money, or effort involved.

While I'm pleased and flattered that the university cared enough to interview my colleagues and me and to shed a light on this wonderful event, this is still a case where the positive PR this may have generated for the university at least in part contributed to the front page display. While the interviewer, photographer, and others involved on the ground floor may deeply care about racial justice, they are operating in a larger system that refuses to take accountability for its negative impact on people of color in the city where the conference is based. While supporters exist in my institution, there is a bottom line that is always going to be impacted by racial justice work and any progress made has to coordinate with or subvert that economic system. This is deeply frustrating. I do not engage in racial justice work in my personal time for recognition, but in this situation, the university structurally is reaping material benefits from my participation, while it will do nothing obviously positive for my standing in the university.

In fact, in my interview, I pointed a finger at my institution for claiming to bring jobs to the city but ignoring that those jobs created massive displacement of people of color through gentrification. That quotation was, of course, not included in the final write-up. At best, this interaction takes advantage of my labor for positive PR. At worst, my visible labor and association with the university will actually help the university offset legitimate complaints from the community that they have done harm to our city and its historic citizens of color.

Story 8: Defining "Interesting" Research

As a new researcher, I often relied on the judgement of my advisor on the direction of my work. We brainstormed ideas together, with some ideas being seen as interesting and some not so much. One day, I was watching a YouTube video [76] on writing, and the speaker stressed the importance of learning your readers. He mentioned that research is a conversation moving through time among researchers. He remarked that the idea was horrifying because historically researchers predominantly looked like him (a White American man), and they get to say what knowledge is and is not. I paused for a moment and was devastated. In America, the lack of diversity in spaces of power has historically disadvantaged minorities. Kang et al. found that minority job applicants who had indicators of their race on the resume received fewer responses to their resumes as opposed to individuals who intentionally removed any indicator of their race [56, 70].

I was reminded of the conversations I had with my advisor. How he would pick and choose which ideas were interesting. I wondered, who determined what good taste was in research if historically research was performed by White individuals? I wondered if my research ideas would appeal to CHI reviewers, industry professionals, etc. Would I even get a job because I chose to pursue a research question that I personally was interested in pursuing, but was not mainstream? I started to fear for my career trajectory. I was told research provides you the opportunity to research whatever you want, but I guess only if it appeases the reviewers who mostly do not share the same race and ethnicity as me, an African American woman.

Story 9: Routine Microaggressions

Microaggressions, by their very nature, are something that we all have experienced frequently [117]. As an undergraduate in my first group meeting with the HCI researchers at my institution, before the faculty arrived a male postdoc in the lab interrogated me about my racial background. Asking, "where are you from? No, where are you really from?" is a routine microaggression that Asian Americans encounter [117]. The postdoc began guessing, "Are you Vietnamese? Huh, well with that name, you must be Vietnamese, but you look Filipino. Oh, you're Chinese? And Japanese and German? Well that's weird. That doesn't make sense." The pointed assessment of my physical features added a gendered component to the interaction, and I very much felt my status as a woman of color in that space. Without any understanding of the power hierarchy of academia, I did not feel comfortable calling out how inappropriate the conversation was. This first microaggression I experienced in an HCI context sticks out clearly in my mind over seven years later, because it set the expectation that this would be routine in my professional life in HCI.

		Critical Race Theory Tenets					
#	Personal Stories	Racism is Ordinary	Race is Socially Constructed	Identity is Intersectional	Interest Convergence	Limits of Liberalism	Uniqueness to Voice
S1	Different Views on Filter Bubbles	x	x			x	x
S2	Editing Away Voices of Color	x				x	x
S3	Interpreting Voices of Color			x			x
S4	Acknowledging Race in Research						x
S5	Everyday Privileges	x					
S6	Who Benefits from Diversity?				x	x	
S7	University Public Relations				x		
S8	Defining Interest Research	x	x			x	x
S9	Routine Microagressions	x		x			

Table 1. Overview of personal stories as they relate to critical race theory tenets.

ADAPTING CRITICAL RACE THEORY FOR HCI

Next, we adapt core ideas from critical race theory, incorporating points raised by our personal stories from the previous section. Throughout the following section, we reference the stories (Table 1) and note how they informed our adaptations.

Racism is Ordinary in Our Socio-Technical World

The stories above are just a very small fraction of the events we have experienced that were tinged or suffused with racism, all in contexts of HCI and/or research: in courses (S1), in paper reviews (S2), in research methodology (S3, S4), in advising relationships (S4, S6, S8), among our research participants (S4), with our colleagues (S5, S8, S9), in corporations (S6), in academia (S6, S7, S8, S9), and in our lives as a whole. Just as critical race theory asserts, racism is an ordinary, everyday fact of life, and the contexts of neither HCI nor research are an exception. That this needs to be said at all, is itself one of racism's most insidious tricks – that those who do not experience racism can pretend that it is an aberration, an occasional brokenness in what is otherwise a functioning world.

Once we start looking, however, racism is truly everywhere and ever-present in our digital society. *Every* online search, *every* social media post, *every* Amazon purchase, and *every* item of mass-market technology is affected by racism in some way because the groups with the most power over these goods and services are insufficiently inclusive: the leadership at big tech firms, tech firm employees, designers, researchers, policymakers, content creators, and tech users themselves. Occasionally, news of this racism breaks through into the mass media: In 2010, some Nikon cameras would prompt photographers to check whether someone had blinked, if an Asian face appeared in the photo [105]. In 2016, much was made of the Google image results for "three Black teens" (arrest mugshots) versus "three White teens" (smiling kids) [60]. More recently, the Plain View Project found thousands of violent, racist, public Facebook posts by Philadelphia police officers [128]. Though such reports are not uncommon, the nature of the news cycle might suggest these events are rare happenings in what is otherwise a pluralistic, race-friendly digital world. But, that would be the exact interpretation that we – and critical race theory – reject. Google apologized, but excused their results, claiming its algorithms were only reflecting what was in the data or online [60], and Facebook continues to wrestle with its hate-speech policies [61]. Most troubling, even these highly publicized problems have yet to be resolved: online search for "four Black teenagers" still returns mugshots as of this writing, and Facebook's automated attempts to ban hate speech now censor discussions about racism by people of color [61].

Again, for those who do not bear the brunt of racism, these seem like minor, occasional problems. But, they are not. People of color are grossly underrepresented in digital games, though they comprise a large proportion of the over-210-million-person U.S. player base [96, 124]. This happens every day. The well-documented phenomenon of online trolling is something that racial minorities are intimately familiar with every time they dare to speak truth to power online [24, 98]. This happens every day. In grade schools everywhere, students are regularly assigned homework to put together slides about, say, an upcoming holiday. While White students find themselves readily reflected in online searches, children of color must make do with White images or think to insert their own identities in the keywords, further reinforcing any self-consciousness with respect to race. *This happens every day.*

Thus, critical race theory's claim of racism's ordinariness in society, translates directly to HCI, both within our community, but also with respect to the broader socio-technical universe that is the subject of all HCI. Extrapolating Winner's proposition that artifacts carry politics [136], it seems abundantly clear that in a world where racism is ordinary, racism in its technologies is also ordinary.

Storytelling and Voices of Color in HCI

Methodologically speaking, HCI already understands the value of storytelling. It is respected in qualitative research, critical design (e.g., [13]), and a range of participatory methods (e.g., [26]). Some work with vulnerable populations – children, adults with mental health problems, indigenous populations, and survivors of domestic violence – explicitly highlights storytelling methodology [86, 119]. Even fictional stories are accepted in speculative design and design fiction [120]. But, echoing some criticisms of speculative design [43] HCI could go much further to ensure that these methodologies are applied in race-conscious ways and to better understand race.

The HCI community could also acknowledge the challenges in sharing and amplifying voices of color: in how words are edited and polished (S2), in how research agendas are selected (S8), and in how race and racism are given space for acknowl-

edgement and historical context (S4). Furthermore, there is an emotional, mental, and even physical toll in performing sensitive work with marginalized groups (e.g., [115]). Both cognitive and emotional effort is required when researchers navigate racial identity with respect to relationships with participants (S3) as well as explicit or ambient threats to professional advancement (S1, S2, S4, S5, S8, S9). Even in presenting our personal stories in this paper, we felt we were stretching the bounds of mainstream HCI research methodology, yet could think of no other way to convey our collective experience.

Bringing out voices of color has a range of benefits to HCI. For a community that values "understanding people" and user-centeredness, underrepresented voices of color offer unique insight into the world that others may not see. Diversity of perspective can also lead to more creative designs [68]. Through stories, people experiencing similar isolation can see that they are not alone (S1, S9), while others can reflect on the impact of how they engage, or fail to engage, with race (S5).

At the same time, any stories of race must be carefully thought through and conscious of its potential impact. As described in S4 and in Related Work, framing of stories disclosed by participants is very much in the hands of researchers, and careless efforts risk exacerbating racist stereotypes. Work with communities of color – while desirable – is particularly fraught, as there is a tendency to assume deficit narratives, in which communities of color are cast as lacking something that can be supplied with technology-based interventions [112].

Interest Convergence & Material Reality in HCI

Pal [95] suggests that HCI efforts on behalf of others benefit the practitioner more than the intended beneficiaries, and a similar dynamic is at play with diversity and inclusion (D&I) in the HCI community (S6), academia (S6, S7), and the tech sector (S6). We saw that realities of research success via publication tend to take priority over the time, resources, and space desired to engage meaningfully with race (S2, S4, S8). And, tangible benefits of status, visibility, professional advancement, and even investment (S6, S7) accrue to those seen to support D&I. On the one hand, this is a sign of our community's anti-racist aspiration; on the other hand, it rarely goes beyond aspiration. The actual outcomes – gains in the proportion of minority groups represented among HCI leadership, researchers, students, paper authors, research participants, or paper topics – are negligible, and this despite the fact that as a scholarly community, we are in control of much of the "pipeline" that is often blamed for racial homogeneity in the tech sector: we select and mentor our students, hire and promote our researchers, and recruit and choose our participants. Individual career advancement for majority D&I proponents in the absence of progress on material metrics of racial disparity suggests that interest convergence is very much in play.

The Limits of Tech Liberalism

Critical race theorists have softened their criticism of liberalism in recent years, as their arguments for race-conscious policies have been appropriated by White supremacists fearing a future in which they are the minority [34]. Our analysis of HCI and technology contexts, however, suggests that critical race theory's original instincts about liberalism were on the mark, and that academic, technocratic, and capitalist aversion to race-conscious work inhibits the fight against racism.

S1 showed how an argument for the efficiency of filter bubbles prevailed as commonsense over other social or political values. S2 suggests that some paper reviewers prefer to edit away minority voices in favor of dominant linguistic norms, perhaps as a way to accede to majoritarian standards. S4 highlights resistance to addressing race in research, in favor of color-blind analysis. These cases have in their background, an ideal of a color-blind future or a technocratic marketplace, in which race truly plays no role and racial disparities no longer exist. Here in the real world, however, racial disparities remain severe.

Critical race theorists such as Cedric Robinson have proposed that modern capitalism, far from being the race-neutral technocracy it claims to be, is itself founded on racism, citing widespread racial associations with socio-economic class during European industrialization [104]. More recent arguments suggest that capitalism's inherent tendencies toward exploitation prey on racial minorities, and further that capitalism's exacerbation of inequality [101] fuels racial antagonism [52]. Today's technology industry seems to supercharge such critiques. It actualizes the economic concentration of wealth through technological infrastructures that exploit private data [123], harvest human attention [138], and squeeze workers and consumers, all while supposedly color-blind algorithms propagate, reinforce, automate, and amplify past and present racial inequalities [49, 125]. Here, we align with others in HCI who question the value of incremental improvements to technology, however "human-centered" they may be, as long as we remain in thrall of a larger exploitative system [45, 71].

CALL TO ACTION

Critical race theory adapted to HCI as above suggests a range of explicit anti-racist actions for our community. Below, we propose actions that are relatively unremarked upon by other HCI work drawing on critical theory. We offer these as high-level ideas; most require additional thinking through and collective deliberation before implementation.

For HCI Research and Practice

True recognition of the pervasiveness of racism in our digital systems would open our eyes to whole new universes of unexplored research questions: What alternatives are there to race-neutral search responses, and which ones successfully navigate the nuanced complexities of race? How can visualizations of race-based data incorporate context that would mitigate stereotyped conclusions? What are creative ways to confound or enlighten racist trolls? Which of HCI's established truths are actually only true of rich, White, developed-world undergraduates? Then, thinking beyond the research topic, outcomes should be interpreted with theoretical lenses sensitive to race. When is it helpful to call out race-based differences? Did stereotype threat affect results? How did the strengths of communities of colors enrich design implications?

Anytime a research team is studying or working with a marginalized group, they must acknowledge an additional

burden of representation. This is true not only for research involving racial minority group members, but for other forms of identity such as neurodiversity, sexuality, ability, etc. Among strategies for thoughtful representation is ensuring that at least some members of the research team represent those research subjects. Several of the papers we reviewed in this paper cite racism and social justice as key motivating elements of their work, but were surprisingly written by all-White authors (perhaps in a case of interest convergence?). We do not question their sincerity, their intellectual contributions, or the desirability of their engagement, but these papers still missed an opportunity to highlight voices of color in a relevant context.

Next, when designing research or writing it up, researchers should strive to be *other-conscious*. Reflexivity – being self-aware and conscious of one's own station and biases as they might affect research and writing – is something that most HCI researchers acknowledge as important [15, 109]. Its important converse is being other-conscious, especially as it has to do with race: to think through one's own research and writing as it might be received by groups that are not one's own. For example, when writing papers, authors often imagine what senior members of the community might critique in a review and revise accordingly. We do this ourselves, and we notice those imaginary reviewers tend to be from the racial majority for historical reasons. But, what if we also imagined how racial minorities would review our research? It would undoubtedly change the care with which we choose projects, recruit participants, describe communities, offer context, and discuss implications. Being other-conscious causes majority readers to be exposed to race-sensitive work and expression, while also being inclusive of non-majority consumers of research.

One desired outcome of other-consciousness is improved racial representation in our research participants. U.S. universities continue to have student bodies that are skewed racially [2], but researchers have long acknowledged this [65]. There are few excuses for poorly proportioned participant pools that result in conclusions that leave out minority data. In qualitative work, convenience sampling should be looked upon critically to ensure studies incorporate minority voices. Where data sets are lacking in appropriate diversity, authors should explicitly acknowledge the deficiency [37, 45].

Paper review processes also deserve consideration. One additional rubric for paper reviews ought to be the degree to which papers considered the potential racial impact of their work. Should a paper's innovations be taken up, would it serve to alleviate racial disparities, or merely contribute to some corporate bottom line? And if a paper is explicitly about race, does it sufficiently bring in a relevant voice of color? Such things could be caught during paper review, were reviews not strictly color-blind. One possibility is to incorporate into the review process a means for reviewers to be informed of author background when relevant (while maintaining anonymity).

For the HCI Community at Large

The foremost question of race for HCI is, are we serious about making our own community more inclusive? If so, more researchers, particularly senior researchers, must commit to identifying, recruiting, and taking on underrepresented minority students, interns, and junior researchers. Lack of diversity is often blamed on dry "pipelines" [121], but ours is a pipeline whose valve the community itself controls. To hold ourselves accountable, SIGCHI should conduct periodic studies to track leadership make-up, community membership, paper authorship, conference attendance, and such by race and other group categories. Progress, or its absence, must be made visible.

Next, issues of race and racism must be raised more frequently in the community in a way that is heard by *all* participants. The Diversity & Inclusion Lunch is good start, but its cost should be subsidized to reduce attendance barriers and to demonstrate larger community commitment. We recognize that barriers are not solely tied to attendance, and we challenge the D&I effort to reflect on the makeup of their committee members, award recipients, and intended community. Relevant panels, workshops, and town hall discussions are also in order. Efforts to improve accessibility for underrepresented students, such as CHIMe – Mentoring in Human Computer Interactions – should be subsidized and turned into annual events [17].

As we become concerned with new dimensions of diversity and inclusion, we cannot dilute efforts to address race. All too often, panels and committees pass as "diverse" because they contain non-males. Race is overlooked as a category of diversity. For example, the SIGCHI Inclusion Innovators Open Call for 2018 called out gender, sexual orientation, professional discipline, economic advantage, and disability, but made no explicit mention of race or ethnicity, adding an ironic insult to injury. We welcome attempts to address other dimensions of discrimination, but such efforts need to add to the pie of resources, not carve away resources from race.

Overall, as a community we can make it clear through public statements and actions that race and racism impact all areas of HCI and talking about this will benefit everyone. SIGCHI is a sufficiently large, well-respected organization that should be more vocal about problems externally, much as the American Medical Association is vocal about bad medical practice. We should establish committees that think through issues of race and technology and engage policymakers and technology companies through position papers, meetings, and so on.

Finally, we hope allies will respond to all of the calls of action above in a spirit of genuine anti-racist progress. Tokenism only confirms claims of interest convergence.

CONCLUSION

We are aware of and grateful for the overall socially progressive tendency of academic researchers and of the HCI community specifically, and we thank allies from all backgrounds who seek to make CHI an inclusive community. Nevertheless, those of us who are not intentionally racist are still complicit in a larger racist system. Those who do not suffer from racism still benefit from its absence. Our paper is not meant to accuse, as much to encourage every one of us (ourselves included) to re-engage, ever more vigorously, in the struggle against racism within ourselves, our communities, and in the socio-technical world.

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