

Intersectional HCI: Engaging Identity through Gender, Race, and Class

Ari Schlesinger, W. Keith Edwards, Rebecca E. Grinter

School of Interactive Computing and GVU Center

Atlanta, GA USA

a.schlesinger@gatech.edu, keith@cc.gatech.edu, beki@cc.gatech.edu

ABSTRACT

Understanding *users* becomes increasingly complicated when we grapple with various overlapping attributes of an individual's identity. In this paper we introduce *intersectionality* as a framework for engaging with the complexity of users'—and authors'—identities, and situating these identities in relation to their contextual surroundings. We conducted a meta-review of identity representation in the CHI proceedings, collecting a corpus of 140 manuscripts on gender, ethnicity, race, class, and sexuality published between 1982-2016. Drawing on this corpus, we analyze how identity is constructed and represented in CHI research to examine intersectionality in a human-computer interaction (HCI) context. We find that previous identity-focused research tends to analyze one facet of identity at a time. Further, research on ethnicity and race lags behind research on gender and socio-economic class. We conclude this paper with recommendations for incorporating intersectionality in HCI research broadly, encouraging clear reporting of context and demographic information, inclusion of author disclosures, and deeper engagement with identity complexities.

Author Keywords

Intersectional HCI; gender; ethnicity; race; class, socio-economic status; intersectionality; identity

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g., HCI): Miscellaneous

INTRODUCTION

“A pervasive, fundamental and highly visible feature of HCI discourse has been its representation of the user...” — Cooper & Bowers [21]

Studies of people and the technology they use have expanded dramatically in the last decade of HCI research.

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HCI's third wave (or paradigm) [14,51] and HCI4D [29] contribute to an increasingly complicated representation of the *user*. As a term, the *user* now represents an expanding, diverse set of people. A number of publications that are critical of the (mis)use of this term have called upon the HCI community to update our language and practices. For instance, Dourish and Mainwaring argue that the term *user* should be abandoned because it essentializes people [34]. Taylor cautions practitioners against only researching “out there” in the quest to expand HCI's reach [92].

But questioning how HCI represents the user is not exclusive to HCI's third wave. In their seminal 1995 essay, Cooper and Bowers examine how representations of the user motivated the development of second wave HCI [21]. They track how the user acts primarily as a “rhetorical cipher,” motivating research directions for the field instead of depicting distinct individuals with complex feelings, motivations, and identities. Nevertheless, representing the user as a nuanced individual, rather than as a “rhetorical cipher” or an essentialized stock character, can help us make visible the ways identity intersects with technology.

In this paper, we ask who the *user* is by investigating how the identity of the *user* is represented. To answer this question, we surveyed a corpus of manuscripts published in CHI, the leading HCI conference, using intersectionality to guide our analysis. Like previous call to action papers, such as “Does Technology Have Race” [50], and “Feminist HCI” [11], we use a specific framework to analyze the impact of identity. We chose intersectionality, a framework that focuses on how various dimensions of identity (e.g., gender, race, and class) coalesce inseparably and relate to the conditions of one's surroundings, because it supports efforts to situate the relationship between technology and social systems. In situating these relationships, we believe this work can help HCI's broader agenda to do the right thing, within and outside third wave research. Our goal is to provide HCI researchers with empirical insight into current identity representation practices in CHI as well as to develop principled insights and recommendations for advancing the representation of identity in HCI.

INTERSECTIONALITY

Intersectionality was first introduced in 1989 by Kimberlé Crenshaw in research highlighting the ramifications of treating gender and race as discrete categories in anti-discrimination legislation—the consequence being that

black women’s experiences were erased [22]. Since then, intersectionality has been applied in various fields, often to highlight how oppression and discrimination impact people differentially based on the intersections of gender, race, and class. It has also been used in fields related to HCI such as Management and Information Systems [62,91,95] and Information and Communication Technologies for Development (ICTD) [53].

In “The Complexity of Intersectionality,” Leslie McCall describes three methodological approaches to intersectional research: *anticategorical* complexity, *intercategorical* complexity, and *intracategorical* complexity [66]. *Anticategorical* methods use discourse analysis to deconstruct analytical categories; this application draws attention to how identity categories are flawed, incomplete, and unable to capture the complexity of the things a category describes. An example of anticategorical research in HCI is Dourish and Mainwaring’s call to abandon the word *user* because of the essentializing simplifications that occur when categorizing individuals with this term [34].

Intercategorical methods use identity categories “provisionally” to document and compare relationships between social groups along multiple identity category dimensions. An example of work that adopts this approach is McCall’s statistical analysis of income inequality within-groups in various U.S. labor markets focusing on gender, race, and class intersections (e.g., in 1989 income inequality in Miami was higher between women of different classes and lower between genders, while in St. Louis income inequality was lower between women of different classes but higher between genders [66]). Within HCI-related research, Ames et al.’s work on social class and technology practices shares qualities with the intercategorical approach—provisionally and carefully constructing categories while acknowledging identity differences within them—because it enables them to characterize social groups quantitatively as well as qualitatively [4].

Intracategorical methods often identify a single set of identity categories, like indigenous women, and then analyze other dimensions of identity within the target community to demonstrate heterogeneity within the group. This method falls between the other two as it focuses on an identity category for multiplicative categorical analysis while deconstructing *a priori* assumptions and understandings of that category. In their work with homeless young people in Seattle, published at CHI, Woelfer & Hendry write portraits of their participants, dedicating around 500 words each to detailing differences in participants’ lives [99]. The authors explain their use of this reporting mechanism as follows: “We did this to emphasize the individual as a whole, and to work with a reporting style that allowed us to bring forward something of the ambiguity, nuance, and tensions that arise through the use of social network sites by this population of users.”

Irrespective of methodology employed, the central goal of intersectionality is to better capture complex identities and relate them to their surrounding context. We believe that intersectionality has wide ranging applications in HCI, like strengthening reporting on the relationship between people, technology, and their surrounding context.

METHODOLOGY

To understand how user identity is represented in the field, we used a survey approach for evaluating HCI literature. For scope, we narrowed our data to CHI publications exclusively. We surveyed the CHI proceedings between 1982—the CHI conference’s first year—and 2016 to empirically evaluate the way identity is represented, discussed, and researched within this community. Methodologically, this process involved developing a set of keywords to search for papers, gathering the manuscripts captured by those terms from the ACM Digital Library, pruning the corpus of manuscripts to remove non-paper artifacts (like posters, keynotes, and workshops), and then analyzing final manuscripts across a rubric of qualitative and quantitative questions. Our methods were informed by prior meta-reviews of the HCI community [19,29,33,56]. In total, we analyzed a final corpus of 140 CHI manuscripts retrieved using a set of more than 50 keywords related to identity categories. This approach allowed us to generate descriptive statistics about how identity is portrayed in CHI and qualitative insights into identity representation.

Developing the Identity Keyword Set

We began constructing a set of identity keyword search terms by using common foci of intersectional analysis, namely, the umbrella categories of gender, race, and class.

Our next step was to produce specific terms within each umbrella group. To generate these terms, we consulted the U.S. census categories [107,109], looked at the demographics reported in prior HCI research, reviewed literature in gender and ethnic studies, and referred to intersectional research. Additionally, we wanted to ensure coverage of various gender identities, moving beyond the binary and cisgender understanding of man or woman. We assured inclusion of transgender and gender fluid identities by incorporating LGBTQIA and similar terms.

The final keyword list included terms that describe gender, ethnicity, race, sexuality, or class such as *transgender*, *boys*, *women*, *black*, *white*, *Native American*, *Asian*, *homeless*, *middle class*, *poverty*. Lexical variations of gendered ethnicity categorizations (e.g., *Chicano*, *Chicana*, *Chican@*, *Chicanx*, etc.) were included and counted under one gender grouping (e.g., *Chicanx*).¹

After the initial list was constructed, the research team communicated regularly to discuss the set of keywords, uncover gaps, and pursue saturation of terms within the

¹ We are happy to make our keywords available on request.

broad category clusters. The keyword set was updated as needed throughout the data collection and analysis process.

Collecting and Culling Manuscripts

We searched the CHI proceedings database in the ACM Digital Library using our keyword set. Manuscripts were gathered based on keyword search matches. The CHI proceedings had 13,972 publications at the start of our search and 13,999 by the end [108]. Keywords with confounding factors like *black* and *race* required additional review to ensure that off-topic content like black boxing, or race conditions was not included in the corpus. We limited the final corpus to papers, notes, and alt.chi publications. All other manuscripts (e.g., poster sessions, student events, plenary sessions, etc.) were removed. Manuscripts within the CHI collection on the Digital Library that were associated with affiliate conferences, like CHI PLAY, were also removed from the corpus. 140 manuscripts remained in the final corpus, representing scholarship published between 1983 and 2016. See Table 1 for a breakdown of changes in corpus size after cleaning the data.

Sets of Publications	Number of Publications	Percent of All CHI Publications
Initial Identity Set	309	2.21%
Final Identity Set	140	1.00%
All CHI Publications	13,999	100.00%

Table 1. Overview of corpus relative to all Digital Library CHI publications published between 1981-2016 (as of 2016).

Analysis of the Corpus

After gathering our corpus, we developed a rubric for analyzing the manuscripts. This rubric included criteria grounded in prior work on the representation of users [21], and intersectionality [23,28,66], and contained qualitative and quantitative criteria. Qualitative criteria include: 1) Who is the subject/user? 2) How and why are the subjects/users represented? 3) How is difference (intersectionality) included or excluded—implicitly or explicitly? 4) How do authors represent their own identity? 5) What are the manuscript’s identity-related goals?

Additionally, we tracked a number of procedural elements such as the location of a study, the type of study, and the institutions of the authors. Additional rubric areas included *notes* for capturing analytical information gathered from close readings—a critical discourse analysis strategy [36], not unlike the strategy described by Kannabiran et al. [56]—of each manuscript, and *thematic observations* for incremental analysis of corpus-wide trends.

After the completion of qualitative analysis, we met and discussed three areas for quantitative analysis. For each of the three areas (A, B, and C, described next), we marked

each manuscript *1* for inclusion and *0* for exclusion. Area A focused on demographic and contextual data that the publications explicitly reported. We looked for reporting of nation/nationality information, regional description, gender, ethnicity/race, socio-economic class markers (homeless, low-income, low-SES, etc.), and age.

Area B tracked explicit identity-related analysis. We called this classification *focus*. A paper was classified as focusing on a topic within an umbrella identity category if it explicitly provided analysis on a topic within that category. For focus classification, we coded three distinct areas: 1) gender focus, 2) ethnicity/race focus, and 3) socio-economic class focus. We describe focus for each umbrella identity category in the findings section of this paper. We note that not all publications that match a keyword search in the Digital Library focus on the relevant umbrella category. For example, “Of Moles and Men: The Design of Foot Controls for Workstations” focuses on foot control designs and not on the gender representation one might infer from the title [73]. This did not happen frequently.

Our third area, C, tracked whether a manuscript did one or more of the following: 1) discussed identity in related work, 2) called on identity-differences to be the focus of future work, or 3) gave a reason for using identity-difference for analysis. We called this *acknowledgement*.

In the remainder of this paper, we refer to the manuscripts collected through keyword search matching as *a priori*. We refer to publications that we manually coded in areas A, B, and C as *a posteriori*. We use these phrases to clarify the difference between *a priori* keyword matching and *a posteriori* manual coding.

Limitations

Conducting research on previous CHI publications focused on identity and intersectionality incurs a number of methodological limitations. One such limitation is our ability to speak to implicitly intersectional publications. Intersectionality can be infused into research through an abundance of potentially subtle actions. While we elaborate on implicitly intersectional work in the sections Intersectional HCI and Intersectional Analysis within the Corpus, the methodology employed in this work may not capture all implicitly intersectional work in the corpus. Particularly, this research misses work focused on intersectionality and identity outside of our main categories (e.g., disability- or age-related keywords, a good fit for intersectional analysis, were beyond this paper’s scope).

Another limitation is the keyword set used to construct the corpus. Our dataset is limited by a focus on U.S.-centric identity-keywords. Focusing on the U.S. census and keywords reported in previous literature exacerbated a pre-existing focus on the United States in this field. This problem appeared in our dataset, and we speak to mitigating implicit U.S.-centrism in the recommendations section. This limitation is further compounded by the complex

relationship between ethnicity, race, and nationality—an entanglement beyond the scope of this work.

Moreover, it is not feasible to create a keyword list that covers all possible identity category descriptors. Yet, through iteration, we constructed a thorough keyword list that provided breadth and depth for this research. We believe this list provides a representative sample of relevant CHI publications. For instance, the keyword Hispanic only produced two initial matches in the CHI proceedings database, and zero publications in the final corpus. This is despite the fact that between 2000 and 2007, Hispanic individuals accounted for the largest growing population in the U.S. [58]. These gaps encourage us to believe that our sample is representative of the umbrella identity categories.

Lastly, the use of the ACM Digital Library presents some additional limitations. There were a number of key motivations for using this search engine, including the capacity to search CHI publications directly, the exportation of keyword search results, and the precedence of using this tool in prior meta-reviews [e.g., 34]. However, this engine is not without its faults. In particular, there was some uncertainty regarding text matching within the body of a manuscript. While searches always match title, abstract, and author keywords, the extent to which search terms match other paper fields varies. For instance, [26] matched to keywords in the class umbrella category, but did not match keywords in the gender umbrella category, despite the use of the word *women* in the paper’s text. Our analysis mitigates this limitation by manually coding category focus for each paper in the corpus. Additionally, we interpret identity keyword matches in the title, abstract, or author keywords as a signal for the significance of the search term in that paper. Thus, these papers are explicitly indicating the importance of an identity category to the paper itself.

FINDINGS

In the following section, we describe how the umbrella categories of *gender*, *race*, and *class* are represented in the CHI Proceedings. For each umbrella category, we describe how user identity is represented in the corpus using an *a posteriori*, qualitative analysis. Next, we discuss overall attributes of the corpus through an intersectional lens, followed by data on context disclosure and author disclosure within the corpus. Finally, we discuss gaps within the Digital Library relative to the identity keyword set we developed. In each section we provide exemplar references that represent a sampling of related papers from the final corpus, rather than an exhaustive list.

Mapping out the Corpus: Gender, Race, and Class

Publications in our corpus were not evenly distributed across time or *a priori* and *a posteriori* classifications. Historically, publications skewed heavily towards the 2000s—two publications during the 1980s (83-86), two during the 1990s (94-97), 33 during the 2000s (02-09), and 93 during 2010-2016. Table 2 summarizes descriptive statistics of umbrella category distribution. Additionally,

Umbrella Categories	Keyword, <i>a priori</i>	Focus, <i>a posteriori</i>
Gender	62.86%	70.00%
Race	12.86%	12.14%
Class	22.86%	30.00%

Table 2. Percent of publications out of all corpus manuscripts that match to umbrella identity categories.²

Table 3 outlines example content from the corpus across a number of *a priori* keywords to contextualize our findings.

Gender

More than half of the corpus matched to an *a priori* keyword in the gender umbrella category. Further analysis showed that an even larger number of manuscripts included an *a posteriori* focus on gender. Analytical focus on gender in a paper manifested in one or more of the following ways: 1) differentiating subjects for statistical analysis based on gender [57,67,105], 2) restricting the population of study to subjects of one or more specific gender groups [20,32,54], or 3) focus on HCI interventions or innovations around a gendered issue (e.g., pregnancy, gender identity and expression transitions, stereotype bias, etc.) [2,3,9].

Gender *focus* manuscripts cover the wide-array of interests and methods represented across the CHI community. These papers use qualitative, quantitative, and mixed methods for data collection and analysis. Publications encompass using cultural probes [20], developing a statistical test for analyzing agreement between groups [97] and harnessing gender-identity and social media for information propagation [106]. There are more than 10 experimental studies in the corpus that compared participants based on a binary male/female gender difference. Papers outside the *a priori* umbrella category that focus on gender *a posteriori* compare groups statistically by gender [67,80], detail gender’s relationship to knowledge and social roles [8,45], talk about gender as it relates to sexual expression and experience [10,43], or discuss gender as it relates to sexual harassment and violence [1,5,84].

Additionally, a handful of manuscripts in the *a priori* and *a posteriori* umbrella category were influenced by Feminist HCI [11]. These manuscripts were particularly concerned with social justice through research in gender-focused areas using Bardzell’s framework: for instance, representing gendered labor on Wikipedia [69], understanding feminist crowd-science [81], and documenting web-design completed primarily by women [39]. There was one manuscript working with Feminist HCI that did not focus

² Keywords are not mutually exclusive and included LGBTQIA terms for saturation (not shown in table). See Limitations for more information regarding differences between keyword matches and focus.

on gender [50]. This is noteworthy because, although Feminist HCI often focuses on gender, the application of this framework is not predicated on gender focus. Rather Feminist HCI involves methods and ethics centered around equity-oriented values and qualities [11].

Race

Manuscripts about race and ethnicity accounted for a small number of publications in the corpus. Further, the number of papers that matched race keywords *a priori* was nearly the same number of papers that were coded for focus on race *a posteriori*. Focus on race was comprised of one or more of the following: 1) selecting participants from specific sets of racial or ethnic groups [15,75,104], 2) developing or evaluating HCI interventions aimed at helping individuals from a particular racial or ethnic group [46,76,89], or 3) detailing the ways race or ethnicity impact technology use, appropriation, or creation [8,50,102].

This set of papers was the smallest within the corpus. Thematic clusters in this umbrella category were very closely linked to *a priori* search keywords. Most of the race

publications were diligent in handling identity, providing detailed information about the identity-related terminology in their research. Many of the ethnicity/race keywords did not return results; we will discuss this in further detail in the section on demographic inclusion and omission.

Class

Nearly a quarter of the manuscripts in the corpus matched to a keyword in the class umbrella category *a priori*, with an even larger number of publications including a focus on class *a posteriori*. Focus on class included one or more of the following: 1) recruiting participants from distinct socio-economic classes [60,65,79], 2) investigating HCI interventions for communities of a specific socio-economic class [76,86,100], 3) reporting the ways certain class groups operate differentially from one another [25,64,90].

Within the final corpus, class is frequently described using the language Socio-Economic Status or SES. These papers included work with homeless populations (matched *a priori*) and ICTD research. Authors across the *homeless* keyword cluster engage in participatory activities

Sample Keywords	Umbrella Category	Sample Content	# of Papers	Additional Examples
women	gender	Developed and implemented a mobile-phone broadcasting system for sex workers in urban India [82].	37	[18,41,63]
transgender	gender	Reported results from an online survey investigating how trans individuals manage sharing or obscuring information on Facebook during gender-identity/expression transitions [48].	3	[13,47]
men	gender	Analyzed support seeking practices of sexual assault survivors/victims on Reddit; findings reveal men are more likely to use a throwaway account when seeking this support [6].	22	[24,32,49]
ethnicity	race	Inspected open-text profile information of U.S. based users on Scratch, a DIY programming language/community, to understand how users represent and discuss self-disclosed ethnicity/race information [78].	6	[40,45,75]
indigenous	race	Explored reciprocity and decolonized methodologies for working with indigenous communities, specifically in remote Australia, in an HCI context [15].	3	[8,87]
African American	race	Reported on development and impacts of a culturally-targeted, job training initiative that encouraged young, low-SES African American men to increase technical skills [32].	3	[76,102]
poverty	class	Proposed a fast, low-cost statistical method for measuring socio-economic status across a country with high-granularity by leveraging existing data [88].	8	[16,67,90]
homeless	class	Provided insights on the relationship homeless individuals in a southern U.S. city have to technology, challenging common assumptions about homelessness and technology use [25].	12	[80,84,98]
socio-economics	class	Investigated mechanisms for building social capital in an economically struggling community and suggested ICT design opportunities for helping economically distressed communities [30].	11	[31,64,96]

Table 3. Sample descriptions of publications included in the final corpus. Number of papers refers to *a priori* keyword matches.

to better understand what designs would most help their participant population [26,60,90,100]. ICTD publications concentrated both on reporting technology use [30,38] and developing HCI interventions [42,68,86] in specific, low-SES contexts. These HCI interventions typically centered around addressing technology needs of people in rural, low-resource, majority-world areas. ICTD studies comprised most of the papers that focus on class *a posteriori* outside of the *a priori* umbrella category [15,74,82]. Like race, there were a number of *a priori* keywords with no matches—*lower class*, *middle class*, and *working class*.

Intersectional Analysis within the Corpus

Within the corpus, only a few manuscripts investigated more than one umbrella identity category. Of 140, only 24 papers included *focus* on more than one of the gender, race, and class umbrella categories, see Table 4. Of these, only three included *focus* on all three categories [32,85,99].

By the nature of this study, this metric only captures work that explicitly provides intersectional analysis. However, within these publications, there are clear oversights in research focus areas. Using the number of papers coded for focus, there are more than five times as many papers that concentrate on gender than there are papers that concentrate on race. Likewise, there are more than two times as many papers that concentrate on gender than there are papers that concentrate on class. We explore opportunities for future work in Intersectional HCI in the discussion.

Identity Focus Intersections	Number of Papers	Percent of Total	Examples
Gender & Race	5	3.57%	[8,17,55]
Gender & Class	11	7.86%	[61,82,86]
Race & Class	5	3.57%	[75,87,102]
Gender, Race, & Class	3	2.14%	[32,85,99]

Table 4. CHI papers in our 140 paper corpus with intersectional foci.

Context Disclosure

Manuscripts were not consistent in providing contextual information about the environment and participants involved in a study (see Table 5). Further, this absence of disclosure took place within a corpus of papers carried out in a global context. One marker of contextual variety is the number of countries that the authors come from, which may not reflect all the countries studies occurred in. Despite the range of author institute locations, barely half of corpus manuscripts reported nation or nationality information and less than half reported regional information about the users. In spite of an implicit, *normal* context, there were many instances where we had difficulty making contextual inferences about a study location. For example, one study had us guessing whether research took place in Germany or

Florida, until learning on page four that the authors used a German translation of a questionnaire [83].

Context Category	Category Disclosed
Nation/Nationality	50.71%
Region	47.86%
Gender	85.00%
Ethnicity/Race	21.43%
Socio-Economic Class	33.57%
Age	64.29%

Table 5. Percent of all corpus papers that explicitly report context and demographic information.

While participant demographic information was reported more frequently, the type of information provided varied greatly. Of all demographic categories tracked, gender was the most consistently reported, followed by age. In contrast, race and class were reported much less consistently. Of the six context categories discussed in Table 5, the average manuscript reported on three of these categories.

Author Self-Disclosure

When examining the ways research participants are constructed, it is also important to reflexively consider how authors represent themselves. While CHI authors commonly refer to themselves throughout a publication as *we*, it is not always clear what information is to be understood from this pronoun. One mechanism authors use to address this is to disclose additional information about themselves. Author self-disclosures appeared in a variety of implicit and explicit forms in the corpus. Outside of methodological disclosures, additional author information ranged from revealing identity-category information [49,75] to declaring how their identities might impact their interpretation of data [39]. Though explicit self-disclosures were infrequent, we focus on reporting these instances as they illustrate transparent choices about what the reader should know as it relates to the publication. We note that there are barriers that prevent or discourage reflexivity, which we attend to in the recommendations section.

Explicit author self-disclosures were often embedded in the methodology section [8,49,59] or in marked sub-sections. These subsections had a variety of titles, like “Self Disclosure” [39], “Researcher Stance” [100,103], “Research Values” [82], and “Ethical Considerations” [6]. Additionally, there were a number of papers [2,11,39,75] with statements on the importance of self-disclosures. The substance of the disclosers varied greatly. They were about previous relationships with participants [17,40,100,103], building relationships with participants [20,71], values statements [6,82], or author-subject power dynamics [8,25].

Demographic Inclusion and Omission

Some keywords did not return any results, within the entire CHI proceedings or our final corpus of 140 manuscripts. Terms with no matches within the entire CHI proceedings include *genderqueer*, *gender fluid*, *LGBTQIA*, *sexual identity*, *queer*, *Asian American*, *Chicanx* and *Latinx* (for all lexical variations), *First Nations*, *Alaskan Native*, *Pacific Islander*, and *lower class*. There were other keywords that returned matches initially, but those manuscripts did not make the final corpus (e.g., they were posters, works-in-progress, and so forth). Additional terms with no matches in the final corpus include *Middle Eastern*, *Native American*, *American Indian*, *Hispanic*, *working class*, and *middle class*. Race had the largest number of keywords that ultimately produced no results in the final corpus.

DISCUSSION

Previously, we described how users' identities are handled in CHI research; in this section we discuss shortcomings and opportunities. Specifically, we take a deeper look into the implications of our findings; highlighting the weaknesses of category-dependent research; and setting a foundation for intersectional practices by investigating the current, segmented state of identity representation in CHI. We begin by providing information about the research team, to set context for our analysis and discussion.

Researcher Self-Disclosure

Our research team is comprised of three white, cisgendered, middle-upper class individuals with national backgrounds from multiple Western countries. Two of us have completed LGBTQIA safe space training. We all advocate for equity and justice, and are committed to the study and practice of social change. Talking about gender, ethnicity, race, and class is difficult. When discussing these topics, it is vital to amplify the voices of people with identities different than our own. This is something we take very seriously and is reflected in our analysis and representation of this data. We acknowledge that by using an intersectional framework, we build on the scholarship and labor of women of color from a variety socio-economic backgrounds; and we are indebted to them. We believe everyone, *especially* those with structural privilege, must work towards creating a more equitable world.

Focus, Acknowledgement, and Gender

In our close reading, we found papers that included *focus* on a particular umbrella category *without* including *acknowledgement* for that same category (see Table 6). Although we observed this across all umbrella categories, it was especially noticeable in the gender category where papers either 1) included participants of a singular gender identity but didn't explain why only that group was included, or 2) reported descriptive statistics across distinct gender groups without explaining the underlying reason for stratifying participants across gender.

Papers in the first group often focused on women exclusively, whether they were homeless mothers [27] or

hospitalized women with severe mental illnesses [94]. We note that although these papers may have been enriched by explicit statements to motivate research into single gender-identity communities, work like this is important for diversifying the individuals we study—especially when addressing the needs of underserved communities.

In contrast, there are potential negative consequences that come from not providing clear motivation in the second group. In this group, it was common for otherwise well motivated studies to report significance between the ways men and women used a computational artifact without a reason for the gendered analysis.

Previous work finds that the culture of “publish or perish” in the U.S. has increased the pressure to report statistically significant results [37]. We worry that reporting statistically significant results based on gender differences alone is pursuing easily attainable results at the expense of a more reasoned analysis. When using identity categories for quantitative analysis, we must ask what our motivations and reasons are for stratifying our participants in particular ways. Why gender, rather than race, class, or a combination of the three? Incorporating intersectionality in statistical analysis by investigating more identity variables at a time may mean it is more difficult to get significant results. However, this also means we are developing fine-grain, well-reasoned statistical inferences about our surrounding contexts. While statistically significant results will be harder to come by, we should embrace this challenge as it allows us to interpret the world in more nuanced and accurate ways. Researchers in Psychology are having similar conversations regarding the over-reliance on undergraduate subject pools and their lack of diversity [52].

Umbrella Categories	Percent of Focus <i>with</i> Acknowledgement	Examples
Gender	79.59% 78/98	[13,57,72]
Race	88.24% 15/17	[15,46,78]
Class	97.62% 41/42	[60,64,93]

Table 6. Percentage of papers that motivate their identity-category based analysis through *acknowledgement*.

Although most papers coded for *focus* but not *acknowledgement* were about gender, we also found examples within race and class. Most of these papers failed to justify why the research was restricted to a specific identity-category group. For example, one manuscript conflated ethnicity with being a non-native English speaker and did not explain why they used an exclusively Asian participant pool [104]. A paper in the class category (that was difficult to code for *acknowledgement*), suggested their target participants of a single class group, the very wealthy, were “extreme” without providing any further justification for studying a single socio-economic population [65].

There were also papers that acknowledged an umbrella identity category they did not focus on. These papers were coded for including *acknowledgement* if they included one of the following relative to a specific umbrella category: 1) citing prior research [1], 2) acknowledging limitations that prevents identity-category focus [101], or 3) recommending future work [77]. These papers demonstrate thoughtful, low-cost opportunities to engage in a conversation about identity representation, even when focus on a particular identity group is not a part of the study design or findings.

Gender

The papers on gender, including those that both *focused* on or *acknowledged* it, often used a relatively simple representation of a rather complex identity category. Many papers used binary, cisgender categories, speaking exclusively about men or women. A side effect of this simplified representation of gender identities is the erasure of trans identities—excluding the few papers focused exclusively on trans individuals (three papers matched *transgender* and none matched *genderqueer* or *gender fluid*). An example of this erasure occurred in the cluster of papers on women’s health, none of which mentioned trans women or the term cisgender. A risk is that health-research (and beyond) in HCI may marginalize trans women while normalizing cis women in designing health technologies.

Generally, research focused on gender was tied to research focused on women. When men were a focus of a paper, they were rarely the only group studied. This is illustrated by the fact that of the 22 papers matched to the *a priori* keyword *men*, 9.09% of them had the word *women* in the title and 54.55% had *women* in the abstract. In contrast, of the 37 papers matched to the *a priori* keyword *women*, zero papers had the word *men* in the title and 40.54% had *men* in the abstract. This gives the impression that gender matters for women and women alone, which warrants reflection.

We want to reiterate that we strongly support research focusing on groups who have historically been discriminated against, like women. What we want to draw attention to here is as follows: 1) people get excluded when we collapse complex categories into simple binaries and 2) the way we currently handle representing participant identity is not equitable. Considering prior work by [19], we know that CHI-study populations skew male, so why aren’t there more papers featuring male keywords? Questioning how identities are represented, what power-dynamics are at play, and how researched communities will benefit from our work can help ensure that we are researching and designing in an equity-forward way.

Categories: Language, Boundaries, & Impact

Our research relied on identity-category labels for analysis. In order to speak coherently about gender, ethnicity, race, and class, we provisionally used categories to investigate how identity is represented within the CHI community—an application of the *intercategorical* methodology described earlier. However, when using categories, there is friction

associated with the ways terms flatten a heterogeneous group into a single word. This flattening function runs the risk of simplifying diverse social groups into stereotypes and reductive caricatures. The anticategorical and intracategorical intersectional methodologies work directly against this reductive capacity of category descriptions.

In this paper, our aim is to contingently use categories to draw attention to identity representation in CHI. Through this methodological approach, we sacrificed some of our ability to produce complicated, boundary-pushing representations of gender, race, ethnicity, and class. Others, including Ames et al. [4], have confronted similar concerns. We believe this trade-off was worth the cost because it increased our ability to draw attention to larger themes in identity-related CHI research. We hope that our analysis encourages more work in Intersectional HCI, including anticategorical and intracategorical research.

Intersectional HCI

Intersectionality asks us to look into the complexity of experience, phenomenologically and materially, as it is impacted by multiple overlapping identity characteristics. This type of research works to promote equity within HCI by explicitly and intricately investigating complexities in use, design, evaluation, language, etc. relative to entangled identities and larger social systems. While at times intersectionality is implicit in research (in part due to the complications of positionality and self-disclosure), it is important that intersectional analysis focus on complexity of identity and the impact (explicitly or implicitly) that identity has on context and design in HCI [e.g., 33,51].

While most manuscripts in this corpus focus on just one identity category at a time, there were a few publications in the corpus that tackled multiple identity categories at once (see Table 4). Within the framework of intersectional methodologies, many of these papers fall under an intracategorical approach by focusing analysis on a specific group of individuals with overlapping identity categories, like homeless mothers [27]. However, some manuscripts with multiple foci reported information on each identity category separately, like sharing results about gender followed by sharing results about race [85]. There were also a small handful of papers that incorporated complex and overlapping identity categories into the design of computational artifacts. These papers build off of third-wave HCI concepts [14] and develop tools that are responsive to intersectional identity-related experiences. Two noteworthy papers are [7], which explores low-SES elderly individuals needing ways to assess the wellbeing of their peers because they cannot afford assistive care, and [64], which explores how two different low-SES regions of rural China with distinct traditional social structures developed different models for technology acceptance.

Identity-Related Scholarship in CHI

Out of all CHI publications in the Digital Library, our corpus contains a startlingly small percentage of papers (see

Table 1). How is it that so few papers matched our search criteria? Given the nearly 14,000 publications we are pulling from, and HCI's foundational reliance on the *user*, it is remarkable that so few papers prominently feature keywords from common demographic identity categories. It invites the question, how is the identity of the user represented if not with these common keywords?

CHI is a large and intellectually diverse community. While there is a significant amount of research within our community that does not involve human subjects, we believe the overall body of CHI research contains a larger percentage of publications featuring *users* than the set of manuscripts in our corpus. We suspect there are many manuscripts within the CHI proceedings that rely on the *user* but do not include representations of their users' identities. These *users* are people whose experiences—which are research relevant—are impacted by overlapping identity attributes, like gender, race, class, age, and ability, even when identity information for them is not provided.

It is clear that the CHI community is thinking more about the *user's* identity than ever before. The temporal distribution of corpus publications speaks to this point, with only four out of 140 papers published before 2000. We encourage researchers to be more explicit about the identity of the people included as research subjects, and to be aware of the extent (if any) with which different gender, race, and class groups are included. Intersectional HCI provides a framework to help researchers incorporate and handle complex identities as a regular part of the research process.

RECOMMENDATIONS

In this paper, our goal has been to map the way CHI represents the complexities of identity. As a community, we are already thinking about ways to make a positive impact on the world with HCI. The 2016 CHI proceedings focused on #CHI4GOOD, including programming “to help the under-served, under-resourced, and under-represented” [35]. Combining our analysis with this investment in social good, we have developed five recommendations for using Intersectional HCI to better handle users' identities.

1. Consistently Report Context

Manuscripts were highly inconsistent about providing cultural context for their research. And yet, providing that contextual information matters given the cultural diversity of users [52]. Our corpus includes papers that highlight how differences in culture result in variations in technology use [64], underlining how important context is. We recommend all publications provide rich contextual details such as national and regional information as well as common social attributes and practices in those locations.

Perhaps unsurprisingly, many ICTD research papers—often documenting non-Western contexts—already disclose detailed context information. This likely reflects assumptions that many readers are not familiar with the local contexts in sub-Saharan Africa or in other majority

world locations. All cultures are worthy of explication [92], and a global research community means we cannot assume any one context is “normal.”

Including context in all settings makes HCI research more accessible to a global, interdisciplinary audience. In recent years, CHI and the ACM have set out to make HCI a more globally inclusive community. The success of this initiative requires making our research contexts, and the implications therein, accessible to our expanding community. Location matters. Studies taking place on the south side of Chicago in the U.S., in the urban Oud-West neighborhood in Amsterdam in the Netherlands, or the Shimane prefecture of Japan come with differing cultural practices and assumptions. We believe that consistent reporting of where studies take place and the contexts of participants will help the interpretability of research results.

2. Consistently Report Demographics

Who we study matters. In order to know if CHI is covering a representative sample of people, studies need to provide demographic information about participants. Knowing our participants' gender identity, ethnicity, racial identity, nationality, socio-economic class, and age will help the CHI community track which populations a study may generalize to and the demographics that need further attention.

We list consistently reporting context before reporting demographics because obtaining demographic information is not always feasible. Not all data types (e.g., tweets or images) lend themselves to demographic reporting. Additionally, it can be difficult, unreasonable, or impossible to provide exact and quantifiable demographic information. For instance, asking participants about their SES may not be feasible because participants may not know how to answer that question or it may bias their answers. In these situations, detailed reporting of contextual information can provide the necessary frame of reference for readers. Richly describing the context in which your study took place—be it an online site like Twitter, a community of activists living in cooperative housing, or British college students—will increase understanding and interpretability of results.

3. Acknowledge Limitations Regarding Identity

It is not always possible to study multiple, overlapping identity categories. There may be a variety of obstacles preventing broader participation—like studying an online community that only collects metadata on race and not gender, or a field site that is not accessible to middle-class individuals. In these scenarios, explicitly reporting the study's limitations in terms of identity categories improves the understandability and transparency of research results.

One example of reporting identity limitations comes from Wyche et al. [101] when they discussed their lack of participation by women, explaining how this was a result of cultural disadvantages reified in their field site that disproportionately affect women in Nairobi. Drawing attention to oppression, limitations, and obstacles of social

groups relevant to a study promotes ongoing work on representation, and discrimination in HCI research.

4. Provide an Author Disclosure

The presence of multiple self-disclosures, both implicit and explicit across this corpus, speaks to how information about authors matters. It is important for authors to consider why there may be a need for a dedicated section disclosing information about themselves in a given project. Likewise, it is crucial for our community to acknowledge that disclosing information may not be in the best interest of the research or the author. Authors with marginalized identities face discrimination on social, professional, and economic levels. Research has shown that the mere presence of names that belong to non-white ethnic groups [12] and white women [70] has resulted in discriminatory treatment of otherwise identical job application material. Further, in 2016 less than half of the states in the U.S. had laws protecting LGBTQIA employees from discrimination [110]. We note that an author should not need to disclose information that could place themselves at risk. One of the benefits of using blind peer-review is to prevent discrimination like implicit bias [44]. We hope to encourage authors in less marginalized positions to adopt reflexive disclosure practices in an effort to normalize this convention and reduce the harmful (often implicit) bias faced by marginalized authors who self-disclose. However, we note that this is not enough to solve these problems. Mitigating implicit bias and reflexive disclosure warrant continuing and extensive action from the HCI community.

Nonetheless, there are informative disclosures that aid in interpretability and do not put the author at risk. We recommend researchers consider if there is information that would help the community better interpret a publication, like a privilege, ethics, or values disclosure. Providing ethical considerations or including information about the author's cultural context helps clarify who the *we* each paper mentions is and how that influences the research.

5. Embrace Complexity of Identity

Lastly, when analyzing and writing up results about users, authors should include as much identity-complexity as is feasible. For instance, when performing quantitative analysis, running descriptive statistics that group participants across more than one identity factor increases the granularity of identity representation. When a study reports statistics about white users versus black users and female users versus male users, the intersection between race and gender is lost in the analysis. Similarly, when performing qualitative research targeting under-represented, under-supported groups within HCI, critically investigating identity-reductive assumptions across multiple identity categories advances our understanding of who users are. For example, studies about the impact of requiring race information when signing up for a particular online service would enrich our community's understanding of how identity impacts and conflicts with design in HCI.

We recommend researchers identify a number of identity categories to track—or deconstruct—in a given study. By intentionally building more complex identity representation into HCI research, our field will produce new facts and inferences about user identity and HCI. It is necessary to be mindful of scoping research such that the complexity does not become unmanageable. Consequentially, out of scope complexities can be reported under limitations, which can help direct the design of future research.

Future Work

These recommendations are a starting point for integrating intersectionality and HCI. We note that CHI is not HCI; however, the recommendations in this paper provide a foundation for Intersectional HCI broadly. In developing recommendations based on our analysis, we introduce mechanisms and opportunities to engage with intersectionality within and beyond CHI. Of these recommendations, the first four call on our community to make small changes to the ways we collect and report data. How we as a field ought to embrace the complexity of identity is an open question with no one answer.

CONCLUSION

We opened this paper with a quote from Cooper and Bowers [21] discussing how HCI discourse is organized around the *user* as a central rhetorical cipher. In this paper, we're inviting the CHI community to unpack this cipher and to reflect on our own practices when representing the identity of the user. Through our intersectional investigation, we uncovered striking segmentations, imbalances, obstacles, and omissions regarding identity representation in CHI. Significantly, we found an absence of research regarding a wide-array of race keywords, a pattern of singular focus on identity categories, and a simplified presentation of complex identity categories. We also found that focus on identity is increasing within the CHI community, with many authors working to describe the *user* as more than an abstraction. These representations of identity present detailed characterizations about who the user is, elevating the depth and context of CHI research.

Our analysis suggests that, although we have produced excellent research with respect to identity and HCI, there is much more to do. One way we can improve as a community is to be more descriptive about who our users actually are, using a richer body of language to explain identity and its context. Additionally, we can increase our attention to the ways multiple facets of identity interact with one another when framing users lived experiences. In offering intersectionality as a framework, we hope to engage the HCI community in discussions about identity, its surrounding context, and our capacity as a field to thoughtfully and inclusively champion just HCI research.

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