Do We Care About Diversity in Human Computer Interaction:

A Comprehensive Content Analysis on Diversity Dimensions in Research

Julia Himmelsbach[1], Stephanie Schwarz[1], Cornelia Gerdenitsch[1], Beatrix Wais-Zechmann[1], Jan Bobeth[1], Manfred Tscheligi[1, 2]
[1] AIT Austrian Institute of Technology GmbH, Center for Technology Experience
Vienna, Austria
{firstname.lastname}@ait.ac.at
[2] University of Salzburg, Center for Human-Computer Interaction
Salzburg, Austria
manfred.tscheligi@sbg.ac.at

ABSTRACT

In Human-Computer Interaction (HCI) research, awareness for the relevance of diversity of users is increasing. In this work, we analyze whether the articulated need for more diversity-sensitive research led indeed to a higher consideration of diversity in HCI research. Based on a comprehensive collection of diversity dimensions, we present results of a quantitative content analysis of articles accepted in the Proceedings of the Conference on Human Factors in Computing Systems 2006, 2011, and 2016. Results demonstrate how many and how intensively diversity dimensions were considered, and moreover highlight those dimensions that have so far received less attention. Uncovering continuous and discontinuous trends across time and differences between subfields of research, we identify research gaps and aim at contributing to a comprehensive understanding of diversity supporting diversity-sensitive research in HCI.

CCS CONCEPTS

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

KEYWORDS

Diversity dimensions, HCI research, considerations of users, study participants, diversity-sensitive research, critical diversity studies

ACM Reference Format:
Julia Himmelsbach, Stephanie Schwarz, Cornelia Gerdenitsch, Beatrix Wais-Zechmann, Jan Bobeth, Manfred Tscheligi. 2019. Do We Care About Diversity in Human Computer Interaction: A Comprehensive Content Analysis on Diversity Dimensions in Research. In *CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland UK*. ACM, New York, NY, USA, 16 pages. https://doi.org/10.1145/3290605.3300720

CHI 2019, May 4–9, 2019, Glasgow, Scotland UK

ACM ISBN 978-1-4503-5970-2/19/05…$15.00
https://doi.org/10.1145/3290605.3300720

1 INTRODUCTION

Research on Human-Computer Interaction has evolved from a technology-oriented to a human-centered view [10]. Indeed, diverse facets of identity and contextual factors have been proven to influence acceptance [44] [90], expectations [82], and the experience of technologies [53]. Thus, researchers are required to deal with diversity dimensions in order to accurately understand users in a given context.

In line with such need, research fields that target specific user groups have emerged. For example, ICT for Development (ICT4D, [26] [36]) aims at enhancing the quality of life of people originating from or living in so-called "developing countries". HCI Across Borders (HCIxB, [62]) strives for globally diverse research teams including the "developing world". Additionally, in the fields of Accessibility and Technology for Active and Healthy Aging or Active Assisted Living [98], people with age-related mental or physical abilities and lifestyles are in the center of interest. Hence, engaging in a reflection on terminology of diversity, questions arise about how user diversity is imagined, whether and where reflections on inclusion are taking place, as well as if and which historically excluded groups are now receiving attention.

In general, diversity dimensions cannot merely be conceptualized as simple characteristics of users. Anchored in the tradition of critical diversity studies (e.g. [15], [41], [55], [107] [109]), we see diversity dimensions both as descriptive and evocative [17]. We define diversity as (i) social differences with attributed social meaning [41], that (ii) refer to social inequality [41] and are embedded in a historically evolved social and structural context [17] [109] and (iii) influence how people live [100] and experience technology. Such a critical concept of diversity can serve as a "multidimensional tool for exploring [...] majority-minority relations" [17] and to understand user experience.

Although applying categories in research carries the risk of passing on prejudices and simplification, it is important to explore social inequalities and related representations [84]. Thus, taking a more diversity-sensitive view in HCI is encouraged. So far, we do not know whether the claim for more diversity-sensitive research actually led to a higher consideration of diversity dimensions in published studies. A multidimensional quantifying meta-perspective based on critical diversity approaches allows to gain a clear understanding on how HCI research considers diversity.

Based on existing theoretical approaches from different disciplines, we propose a collection of diversity dimensions towards a more extensive observation scheme that is used to investigate how diversity of users is represented in HCI research. We systematically analyze the Proceedings of the ACM CHI Conference on Human Factors in Computing Systems, known as the flagship HCI conference. In a comprehensive content analysis, we explore considerations of diversity as quantified by the number of keyword occurrences. By investigating how often dimensions have been referred to in a paper, we show which dimensions of diversity have been dealt with more frequently and which ones have so far received less attention within the selected body of HCI research.

To illustrate the current state and how it has grown historically, in total we analyzed 1,107 articles published in the years 2006, 2011, and 2016. By this approach, we supplement the state of research by taking a meta-perspective on the HCI field allowing an overall assessment of the status quo. Including the proceedings of 2006 allows to cover developments over a decade of HCI, and the proceedings of 2011 reveal continuity and discontinuity of trends. Additionally, we investigate differences between the scientific subfields based on the ACM Computing Classification System (CCS) [9].

By analyzing a comprehensive collection of diversity dimensions and multiple years of CHI proceedings, we get to the bottom of the question whether and to what extent the various diversity dimensions have been represented in HCI research over the years. Uncovering research gaps, we draw our conclusions and perspectives for the consideration of diversity dimensions in future HCI research by providing best practice and method recommendations on how to identify relevant dimensions as well as how to collect diversity information in user involving research attempts.

2 RELATED WORK

In the following sections, we summarize historical developments within HCI research in terms of considering diversity of users. Further, we describe existing approaches about how to consider diversity dimensions in HCI research.

Evolution of Diversity Sensitivity in HCI

Through the evolution of HCI research, many researchers have been abandoning the technology-centered view in favor of a more human-centered one [10]. Some researchers began to focus their research questions not solely on technology development but also on ways to improve user experience [10]. In the 1970s, users were seen as a component in a rational machine and in the 1980s as a source of error [63]. This concept corresponds with the first wave of HCI [18] [52]. In the 1990s a more holistic understanding was established. Users were regarded as partners in social interaction [63]. In line, research during the second wave of HCI aimed at understanding the users' mind [51]. In the 2000s, marketing and design rationales gained influence; on the one hand, bearing the risk of focusing on market segments instead of humans, on the other hand, supporting experience-oriented developments [63] [72]. In accordance, Bødker [18] highlights the importance of experience and context in the third wave of HCI. Moreover, Harrison, Tatar & Sengers [52] claim that the third wave in HCI has to acknowledge the situatedness of users as well as researchers; knowledge and sense-making is always placed within a context – including the social context related to diversity dimensions such as gender [51]. Consequently, research communities met the demand for more context awareness, e.g. by establishing novel *in situ* prototyping and testing practices [65].

The shift of paradigm raised the attention to interindividual differences and their analysis. Such awareness for the relevance of diversity dimensions in research is reflected by the content in HCI conference publications. Having our analyzed material corpus situated in this context, we took a closer look at current indicators. Beside the reporting research and presenting findings, diversity can be subject of discussion or inspire starting points for the development of new approaches. Once again, promising developments can be observed: For instance, at the CSCW Conference 2017, a workshop on design methods for "underserved communities" took place [39]. At the IDC Conference 2017, barriers and enablers for equity and inclusivity regarding diverse children

and families were addressed and research approaches were developed [87].

For example, the scientific community works on global, ethnic, racial, gender, institutional, able-bodiedness-related or cultural diversity of researchers and developers [104]. Thus, diversity aspects can be addressed targeting the scientific community. To name examples, the grassroots campaign #CHIversity [91] aimed at highlighting diversity-related and in particular feminist issues by fostering network building and critical discussions and drawing attention to diversity aspects. Wisniewski et al. [104] organized a panel to discuss aspects of diversity of the scientific community.

However, although diversity and user involvement are taken more seriously, the broader population seems not to be included in most research attempts as samples include narrow and unrepresentative parts of the population. Commonly, those people who are easily available to the research team are involved. Thus, participants in user studies are often students [8] [22]. A large proportion of published studies is realized in so-called WEIRD, i.e. Western, educated, industrialized, rich and democratic societies and as a consequence, participants belong to WEIRD societies, showing a clear tendency in socioeconomic status, age, and education, what makes them unrepresentative of the world's population [8] [53]. Further, more men are involved in user studies. Although there has been a shift towards involving more female and fewer student participants [12], social groups are far away from being equally represented.

An earlier analysis of CHI publications revealed that in 2014 only 58% of the CHI manuscripts reported a measure of age and only about three quarters reported gender [22]. Socio-demographics are sometimes not even described in papers [22]. Thus, reporting and considering demographic aspects in scientific publications does not seem to be the norm yet. Either demographics are not considered useful or necessary, as researchers prefer to "identify human universals" [8], or in other cases, methodological concepts do not enable demographic data acquisition [84].

In summary, the HCI field has developed in the direction of meeting awareness for diversity and realizing a human-centered view, but important work reveals that gaps still exist. Nevertheless, literature addresses yet a limited number of diversity dimensions, whereas clarity is needed on where the HCI field stands in the current consideration of diversity dimensions from a quantitative and comprehensive point of view.

Capturing Diversity Dimensions in HCI Research

Considering the diversity of users holds importance for explaining technology usage and user experience. Demographic changes contribute to the awareness towards certain dimensions. The fact that 95% of the total American population owns a cell phone or a smartphone [76] and 84% of Europe's population uses the internet [40] challenges stereotypes about users, such as being young, male, white, middle or upper class, etc. As computer usage of people aged 65+ has grown, the characteristics of the user group of older adults are gaining more attention [73].

Respective studies revealed that age is a predictor of the willingness to use technology and moderates the way people act [28] [31] [74]. Also, gender-related effects in attitudes towards technology (e.g. [28] [64] [74] and usage (e.g. [44] [58]) are subject of interest of several studies. However, especially the first waves of feminism did focus on middle-class and white ciswomen (i.e. women who experience their gender corresponding to the sex assigned to them at birth) and also following waves of feminism situated in WEIRD countries often focus on WEIRD issues. Thus, gender roles differ both within societies and globally and results obtained cannot be generalized without further considerations.

A recent literature analysis [84] of 140 diversity-related CHI papers published between 1982 to 2016 showed that research tends to include only a limited number of dimensions. Most of the research focused on gender: more than five times as many papers target gender compared to race and more than twice as many gender compared to class [84].

As for race and its relevance for technology developments, Hankerson et al. [50] give examples of racial design and draw attention to *othering* processes [88], i.e. assigning the role of a foreign "other" which is not part of a society or group.

Further, differences can be observed in class and economic and situational aspects, such as living in poorer rural areas [96] or areas with missing connectivity [35] [61]. In contrast to former times, also low-income households have access to modern technology [106], showing again the relation to historical developments in HCI.

Not only gender, class, and race but also other diversity dimensions become relevant in the context of technology usage: For example, relationship and parental status favors that technologies are shared, especially in case of low socioeconomic status [30] [69] [106]; data on parental status and geographic location are important to gather when examining communication habits [23]; income, parenthood, and education have an impact on technology usage [28] [30] [69] [106]. These dimensions were shown to be highly interactive, as, for instance, parents' education and income influence children's academic achievements, depending also on their race [32]. Nevertheless, education is frequently not considered in HCI research [22], making generalizations of findings nearly impossible. In the end, there are even more dimensions of relevance in HCI: For instance, cognitive abilities and their variability across age or literacy levels play a role when interacting with technology (e.g. [21] [24]).

In recent years some HCI researchers show increased awareness of methodological limitations in their work (e.g. [105]) when specific diversity dimensions are not examined and highlight the accordant need for future research [83].

Diversity dimensions should be considered in all stages of a research process and thus, in all respective sections of an article when reporting research and development activities. This means that diversity dimensions should be explicit and in-depth reflected in the outline of any research and development interest as well as in methodology, design, and implementation, evaluation results, conclusions, and limitations. Yet, a quantitative investigation of the intensity of considerations in respective sections of HCI research papers is missing.

3 METHODOLOGY

To gain a comprehensive picture of how user diversity has been reflected in HCI research, we conducted a quantitative content analysis of the published proceedings of the ACM CHI Conference on Human Factors in Computing Systems. The analysis focused on CHI as one of the leading conferences, where published papers earn high visibility and recognition within the HCI community with high citation rates (e.g. [5] [45]). Thus, articles appearing in CHI proceedings have a remarkable impact on future research and development activities.

The content analysis captures developments covering the years 2006 to – ten years later – 2016 by focusing on the proceedings of CHI'06 in Montréal, Canada [1], CHI'11 in Vancouver, Canada [2], and CHI'16 in San José, USA [3]. All papers and extended abstracts were included in the analysis resulting in a material corpus of 1107 papers. Despite having spared to analyze all papers published between the years 2006 and 2016, our approach enables us to i) illustrate the current research practice in the handling of user characteristics (2016), ii) explore historical developments (2006 vs. 2016), as well as iii) assess continuity over the decade (2006 vs. 2011 vs. 2016).

Following Potter & Levine-Donnerstein [79], we chose a theory-driven approach for category development to ensure the validity of the applied coding scheme. First, we created a collection of diversity dimensions based on existing frameworks and validated the collection with HCI experts. Additionally, we coded the assigned ACM CCS [9] classification to be able to draw conclusions on differences between subfields of research. Data were aggregated with papers, publication year, and CCS classification serving as units of analysis. The procedure is described in detail in the following sections.

Coding Scheme

As "[d]iversity refers to any mixture of items characterized by differences and similarities" [97], we had to decide which "items", or in our words diversity dimensions, to include in the analysis. To enable a theory-based coding scheme (the final scheme is presented in Table 1), an interdisciplinary review of existing diversity frameworks was done. The collection should serve as a heuristic view and observation scheme for social differences in multidimensional and multi-perspective ways without essentializing identities (cf. [17]). We validated the collection with interdisciplinary experts.

Dimensions in Previous Literature. In an interdisciplinary literature search, existing theoretical approaches and frameworks for the conceptualization of diversity and relevant dimensions were reviewed. In doing so, we collected diversity dimensions and created an initial set of keywords describing these dimensions. In particular, we based this collection on four theoretical approaches and frameworks from different disciplines.

First, the widely used framework by Gardenswartz & Rowe [43] on "the four layers of diversity" [43] provided an initial collection of potentially relevant dimensions. The framework is based on Loden's & Rosener's [66] work and was developed as systematic attempt to explore diversity in workgroups and its relation to performances. However, diversity management frameworks developed under the business paradigm show clear limitations (see e.g. [55] [101] [109] for the history of diversity studies). They tend i) to naturalize identities into objective entities, at the same time neglecting their social nature and societal context [15] [109], ii) not to take power (theories) into account while underestimating the historically grown social structure of inequality [38] [80] [109], iii) distract from underlying power relations with positive rhetoric [7] [15] [19] [37] [109], as well as iv) mostly apply the (more powerful) management perspective and might not be applicable to other than US countries [108] [109].

Despite its shortcomings, most dimensions in the framework indeed cover relevant dimensions that meet the requirements of critical diversity studies, emphasizing axes of social differentiation. In line with critical diversity studies (e.g. [15] [41] [55] [107] [109]), we included the dimensions which are related to social inequality, loaded with social meanings [41] and related to social realities, practices and structure [107] [109], especially in terms of HCI and technology. We discuss the dimensions separately and explain the modifications subsequently.

The first layer of the model represents the unique personality of a person. Personality, as probably the most multifaceted construct, has been undergone various attempts of conceptualizations and operationalization founded in many sociological, psychological, developmental theories and philosophical conceptions. As completeness of concepts cannot be ensured in our quantitative analysis, we abstained from including

personality to the coding scheme. In contrast, we acknowledge that personality and identity formation are related to diversity dimensions [103].

The second and third layers of the model are based on Loden's & Rosener's work on [66] primary and secondary dimensions of diversity, whereas primary dimensions include *Age, Ethnicity, Gender, Physical Abilities, Race* and *Sexual Orientation. Ethnicity* and *Race* are two separate dimensions even though sometimes used as synonyms [43] [66]. Both do not refer to biological attributes but to social constructs. *Race* is based on presumptive physical characteristics such as skin color or facial features, general social similarities and formation of groupings including self-identifications of individuals [13] *Ethnicity* captures the affiliation to a social group characterized by nationality, culture, language, norms, etc., which becomes visible and socially meaningful through social interactions with other groups [102] [14]. Thus, we kept *Ethnicity* and *Race* as two separate dimensions. Also, we renamed the category *Gender* to *Gender & Sex* to include more theoretical concepts of the dimension.

The secondary dimensions of diversity include *Appearance, Education, Geographic Location, Income, Marital Status, Parental Status, Religion, Work Experience*, as well as *Personal* and *Recreational Habits* [43] [66]. Even though they are important for identities and influence experiences, *Personal* and *Recreational Habits* as well as *Work Experience* do not form social groups based on categorizations. Hence, we decided to remove these three dimensions and to keep the remaining seven.

Appearance describes to what extent a body is perceived as "normal" and/or beautiful according to social norms. In contrast to *Physical Abilities*, this dimension is more modifiable and includes, for example, clothing style, garments and body size and weight. *Geographic Locations* targets rural areas, cities as well as a global perspective, e.g. the country a person lives in. Based on the extension [99] of Gardenswartz' & Rowe's [43] framework, we integrated *Language & Accent* as one separate dimension. Furthermore, we merged the dimension *Income* with *Social Class* as it offers a broader view.

The fourth layer postulated by Gardenswartz & Rowe [43] captures the organizational level referring to individual aspects in work contexts. For instance, career level within a company or work location are discussed. Again, these dimensions were excluded as they are work specific and relevant for a business perspective.

Furthermore, social science literature was reviewed to identify additional dimensions or verify or modify included dimensions. The categories *Class, Gender*, and *Race* were already reflected in our set of diversity dimensions. Additionally, *Body* must be considered. Body-related hierarchical systems including ageism, lookism, ableism [103] are reflected in our coding scheme within the dimensions *Appearance, Age*, and *Physical Abilities*. Further, we added *Mental Abilities* to the scheme to fully capture ableism.

As a next step, so-called hierarchical lines of difference [68] confirmed the dimensions *Gender, Sexual Orientation, Race, Ethnicity, Class, Culture, (Able-)Bodiedness* and *Age*. *Geographical Location* was merged with social development status, nation or state as well as geographical location ("the West and the Rest"). Sedentariness ("settled" – "nomadic" and "native" – immigrated") was added to *Ethnicity & Culture*. To grasp migration, we integrated a new dimension. We see *Migration Biographies* as a distinct dimension, although, as with almost all dimensions, there are connections with other dimensions. *Migration Biographies* show their relevance when it comes to refugees or expats as study participants, for example. On the one hand, *Migration Biographies* often have an identity-building effect and on the other hand, they are a matter of discrimination. Therefore, *Ethnicity & Culture* or *Language & Accent* would not adequately cover this dimension.

Finally, we integrated the concept of WEIRD, i.e. Western, educated, industrialized, rich, and democratic, participants [53] [54] [92]. Foremost, this characterization describes the *Geographic Location* which was already covered by the coding scheme, but on an individual level, also the dimensions *Education* and *Class* are a matter of subject.

Expert Workshop and Final Collection. To assess the validity of the collection of dimensions, the coding scheme was discussed with ten HCI experts in a 90 minutes workshop. Experts had different levels of research experience, ranging from junior to senior level. Further, the group represented the interdisciplinarity of the field including different academic backgrounds, for example, psychology, social science, and computer science. Seven persons identified themselves as males, three persons stated they are female. All participants were born in Austria or Germany and one person of color participated in the workshop, reflecting limited cultural, ethnic and racial diversity, and all experts were able-bodied. All experts were familiar with researching on specific dimensions such as aging or on context influences and/or make use of critical thinking and making. Participants were used used to the reflection of their situatedness. All experts had experience in participatory research and user involvement, reporting studies and writing papers.

After an introduction about the study purpose, the set of dimensions was presented on paper charts in a world café setting [20]. In groups of two to four, experts discussed the relevance of all dimensions and added more relevant keywords based on their experience. These keywords were meant to describe each dimension and served as a search

Table 1: Elaborated set of diversity dimensions and example keywords used for coding

Dimension	Example Keywords
Primary	
Age	year, old, young, childhood, elder, teen
Ethnicity & Culture	Tradition, heritage, values, moral, collective[ist], individual[istic], sedentariness
Gender & Sex	Queer, cis, male, female, feminine, masculine, man, men, woman, women
Mental Abilities	Cognitive, IQ, MCI, disabilit[y], impairment, dementia
Physical Abilities	vision, BVIP, hear[ing], motor, disabilit[y], impairment, muscle
Race	Skin color, [people] of color, white, black, African, Caucasian, Hispanic, Native
Sexual Orientation	hetero[sexual], homo[sexual], LGBT[IQ+], gay, lesbian, straight
Secondary	
Appearance & Body	beaut[y], size, height, weight, BMI, fat [studies], cloth[ing], garments
Class	Income, earnings, ownership, labor, socioeconom[ic], employee, occupation
Education	School, literacy, study, university, kindergarten, college, apprenticeship
Geographic Location	Country, region, area, rural, urban, municipal, district, West, South, Asia, Americ[a]
Language & Accent	Native, tongue, dialect, jargon, speech, slang, articulat[ion]
Migration Biographies	Migration, [country of] birth, birth[place]
Parental Status	Parent, mother, father, birth, foster[parents]; indirect: child, step[child]
Relationship Status	Single, married, widow, partnership, civil union, engaged, girl-/boyfriend
Religion	Belief, atheist, agnostic, Christ, Islam, Sufism, Buddhism, Judaism, Orthodox

strategy for the following coding procedure. The final coding scheme with assigned keywords which were used in addition to the dimension labels for the coding procedure is shown in Table 1.

Coding Procedure

Coding of dimensions was performed via an auto-coding function using the software ATLAS.ti version 8 ([4] which allows to search for a priori defined keywords and manually confirm or reject setting codes and thus, ensuring the validity of assigned codes. Setting the search strategy to "text" guaranteed that words containing the search term (e.g. "children" when searching for "child") were marked as occurrences. The coding procedure was performed by one coder to ensure consistency within the analysis. As we coded manifest content, i.e. directly observable data, with a predefined and explicit coding scheme, the coding procedure did not require subjective interpretation applying the coder's interpretative scheme as it would be the case with coding latent content. For these procedures, coder fatigue is the greatest risk for insufficient reliability, which cannot be tested with intercoder reliability tests [79]. Thus, we did not need to involve a second coder to report reliability measures. We mitigated that risk of coder fatigue by explicitly instructing the coder about the relevance of high concentration in the coding training and by giving sufficient time to complete the task.

Coding training further included detailed explanations of the scope of the study, dimensions of diversity and coding procedure. Before the actual coding of the papers started, the coder conducted a test coding session, where all assigned and rejected codes were discussed. In case of doubt, codes were marked and double-checked with the co-authors of this article. Coding included the recording of the diversity dimensions, the publication year and the ACM Computing Classification System (CCS) (1998 version) [9].

Diversity codes were only assigned when the authors of a given publication described their own work. If keywords occurred only in the description of the state of the art, they were not coded. Thus, only occurrences in the abstract, outline of the research interest and need, methods, results, conclusion and limitations section were included. We set an artificial maximum at 30 codes per diversity dimension per paper. In sum, 30 codes per dimensions were reached only 81 times (0.78% of assigned codes). This empirical fact underlines the research decision that 30 occurrences of a diversity dimension reflect a highly intensive examination of a dimension.

During the coding procedure, sentences or tables served as coding units, i.e. a code could only be assigned once no matter how often it appeared in a sentence or table. For the analysis, papers served as units of interest. In other words, data reflect how many sentences of a paper refer to each diversity dimension.

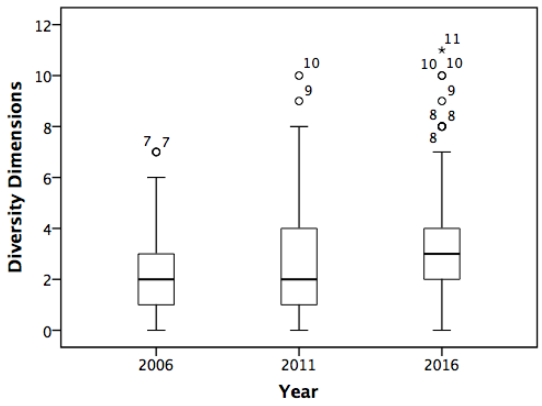

Figure 1: Number of diversity dimensions per year.

4 FINDINGS

In sum, diversity dimensions were considered 10,403 times in 897 papers (81.03% of 1,107 papers in total). At least one dimension occurred in 82.6% of the analyzed papers in 2016 compared to 80.9% in 2011 and 75.8% in 2006. Figure 1 shows the number of dimensions and their distributions per year in box plot diagrams.

A Kruskal-Wallis Test was applied as normal distribution was not given. The analysis revealed significant differences between the number of diversity dimensions ($\chi^2(2) = 18.164$, $p < .001$). The average of 2.07 ($SD = 1.76$) dimensions considered in 2006 increased significantly to 2.51 in 2011 ($SD = 1.93$, $U = -75.868$, $p = .033$) and to 2.78 in 2016 ($SD = 2.00$, $U = -119.818$, $p < .001$). In contrast, 2011 and 2016 did not differ significantly.

To further investigate differences between the three considered years, a Kruskal-Wallis Test was applied for each of the addressed diversity dimensions. Results are listed in Table 2. In particular, means and standard deviations indicate how often each dimension has been considered, calculated by summing up the occurrences of the respective keywords per dimension per article and averaging per year. Percentages show the proportion of articles considering the respective diversity dimension in the years. In this vein, the table describes that in 2006 *Age* occurred on average 1.53 times per article ($SD = 3.96$) and that these occurrences can be found in 52.94% of the articles of 2006.

We found significant differences between the considered years for the primary diversity dimensions *Age* ($\chi^2(2) = 27.246$, $p < .001$), *Ethnicity & Culture* ($\chi^2(2) = 17.245$, $p < .001$), *Gender & Sex* ($\chi^2(2) = 10.855$, $p < .001$), and *Race* ($\chi^2(2) = 14.167$, $p = .001$). Post hoc tests showed that for *Age*, there was a difference between the years 2006-2016 and 2011-2016 ($U = -127.672$, $U = -77.315$, both $p < .001$), for *Ethnicity & Culture* also the years 2006-2016 and 2011-2016 ($U = -43.154$, $p = .001$, $U = -24.918$, $p = .009$), for *Gender & Sex* differences between 2006-2016 and 2011-2016 ($U = -120.812$, $p < .001$; $U = -53.133$, $p = .023$), for *Race* between 2006-2016 and 2011-2016 ($U = -35.057$, $p = .003$, $U = -21.297$, $p = .016$). In terms of the secondary diversity dimensions there was only a significant difference for the dimension *Geographical Location* ($\chi^2(2) = 8.836$, $p = .012$). Post hoc tests revealed that the difference was between the years 2006-2016 ($U = -57.125$, $p = .009$). In almost all cases there was an increase in measuring the

Table 2: Mean occurrences (standard deviations) and percentages of papers (N=1107) per dimension in the years 2006, 2011 (n= 409), and 2016 (n=545)

Dimension	2006	2011	2016
Primary			
Age**	1.53 (3.96)	2.29 (5.31)	2.80 (5.74)
	52.94%	59.66%	69.54%
Ethnicity & C.***	.01 (.08)	.13 (.92)	.33 (2.10)
	0.65%	3.91%	8.44%
Gender & Sex***	1.13 (3.03)	1.56 (3.68)	1.73 (3.13)
	53.59%	62.59%	67.52%
Mental Abilities	.08 (.51)	.08 (.65)	.17 (1.51)
	2.61%	2.69%	3.85%
Physical Abilities	.18 (.76)	.57 (3.24)	.47 (2.15)
	8.5%	9.05%	13.21%
Race**	.01 (.16)	.05 (.33)	.24 (1.62)
	0.65%	3.18%	6.97%
Sexual Orientation	.00 (.00)	.00 (.00)	.07 (1.23)
	0.00%	0.00%	0.92%
Secondary			
Appearance & Body	.03 (.32)	.14 (1.59)	.15 (1.33)
	0.65%	2.20%	3.49%
Class	.38 (1.40)	.52 (2.08)	.51 (2.44)
	15.69%	18.58%	18.35%
Education	1.46 (4.18)	1.79 (4.95)	1.33 (3.55)
	40.52%	44.01%	40.73%
Geographic Loc.*	.24 (1.10)	.72 (3.02)	.76 (3.10)
	9.15%	17.60%	19.45%
Language & Accent	.07 (.32)	.24 (1.70)	.10 (.52)
	4.58%	8.31%	4.77%
Migration Bio.	.00 (.00)	.00 (.07)	.12 (1.82)
	0.00%	0.49%	0.92%
Parental Status	.41 (2.59)	.90 (4.32)	.81 (4.13)
	7.19%	10.27%	9.91%
Relationship Status	.41 (1.54)	.38 (1.76)	.45 (2.62)
	10.46%	8.56%	9.17%
Religion	.00 (.00)	.00 (.05)	.03 (.60)
	0.00%	0.24%	0.55%

$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$, $C. = Culture$

respective diversity dimension. Even though not significant, only the mean occurrences of *Education* slightly decreased.

In a second step, we explored differences between subfields of research. Thus, we checked how these articles were distributed among the ACM CSS to get insights about how the scientific communities investigate diversity within their research. In sum, 32 papers which were either not assigned to any CCS concept or use the 2012 scheme were excluded from this analysis.

Most articles considering at least one diversity dimension were classified under *H Information Systems* (n = 1009 articles in total, with keyword occurrences in 816 articles). Most of the papers considered *Age*, *Gender*, or *Education*. The second most frequently mentioned dimensions were in *K Computing Milieux* (n = 120, 103 articles) followed by *J Computer Applications* (n = 39, 33 articles), *D Software* (n = 28, 24 articles) and *I Computing Methodologies* (n = 36, 23 articles). Less than five articles assigned to the remaining categories considered the diversity dimensions (*B Hardware*: n = 4, 3 articles; *C Computer Systems Organisation*: n = 2, 2 articles; *E Data*: n = 1, 1 article; 0 articles in *A General Literature*, n = 1, as well as *G Mathematics of Computing*, n = 1).

The detailed examination of the differences between the classifications was calculated only for 2016, since some occurrences change over the years and we are primarily interested in the most recent situation. Mann-Whitney U Test revealed significant differences between certain CCS subfields (n = 513) (see Table 3). Again, mean occurrences per paper served as an indicator for the intensity of considerations. Results show that *H Information Systems* (n = 468) shows lower mean values for *Age* (U = 13,423.0, p = .020), *Ethnicity & Culture* (U = 14,799.5, p = .021), *Mental Abilities* (U = 15,271.0, p = .030), *Race* (U = 14,233.0, $p < .001$), and *Religion* (U = 15,712.0, p = .005). Within the CCS concept *D Software* (n = 13), *Sexual Orientation* is considered more intensively (U = 3,642.0, p = .010) and within *K Computing Milieux* (n = 72), *Mental Abilities* shows higher mean occurrences (U = 18,407.0, $p <$ .001). Given that only one paper formed the corpus in the categories *E Data* as well as *G Mathematics of Computing*, no Mann-Whitney U Test was computed for these classification categories.

Table 3: Significant mean occurrences (standard deviations) of dimensions per CCS category

CCS: Dimension	Within Classification	Other Classifications
H: Age*	2.61 (5.41)	4.42 (7.67)
H: Ethnicity & Culture*	0.28 (1.77)	0.71 (3.69)
H: Mental Abilities*	0.17 (1.58)	0.22 (1.12)
H: Race***	0.19 (1.49)	0.62 (2.38)
H: Religion**	0.00 (0.05)	0.22 (1.69)
D: Sexual Orientation*	0.23 (0.83)	0.07 (1.24)
K: Mental Abilities***	0.53 (2.15)	0.12 (1.40)

$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$

5 DISCUSSION

In the last couple of years, there has been a call for actively considering user diversity in HCI research. Yet, it remained unclear if this call for more diversity-sensitive research is indeed reflected in accepted publications. In this work, we presented a interdisciplinary collection of diversity dimensions as an descriptive and evocative observation scheme and respective results from a content analysis of CHI publications from 2006, 2011, and 2016, revealing the following main findings.

First, an increase in the number of published papers that offer information on user diversity could be shown. The number of dimensions and the intensity of attention towards certain dimensions, reflected by the average number of occurrences, has significantly increased. We conclude that researchers, as well as reviewers, seem to be indeed sensitized about the potential impact of interindividual differences on the interaction with technological artifacts. More concretely and referring to the third wave of HCI [18] [52], the concept of situatedness of users, which refers to the idea that people make sense of interaction and technology based on their physical and social situations and thus, implies the consideration of diversity dimensions, is indeed increasingly reflected in publications.

Second, research has addressed only a small number of dimensions per article yet. Although the number of dimensions considered per paper has increased since 2006, this trend has flattened out between 2011 and 2016 and is still below three dimensions addressed per paper. In line, Schlesinger et al. [84] showed, that researchers consider gender, ethnicity, race, class, and sexuality only one at a time. Thus, even though considering multiple dimensions, the relationship among them might not be part of the research activities.

Third, we investigated which dimensions are of interest for researchers. Using the collection of diversity dimensions as an observation and coding scheme, we are able to draw a comprehensive picture of the consideration of diversity within CHI communities. By analyzing the respective frequencies of keyword occurrence per dimension, we found that dimensions seem to have different relevance for researchers; respective research gaps despite an encouraging trend were revealed.

Age, Gender & Sex as well as *Education* have been the most frequently examined dimensions over the years. We identified an increasing intensity of considerations of primary

diversity dimensions, in particular *Age*, *Gender & Sex*, *Ethnicity & Culture*, and *Race*. In contrast, reporting information about *Education* has been more common and the practice has been quite stable. This might reflect the long history of students as research participants [8] [22]. Discussing such research practices might have led to a broader consensus on reporting *Education* levels of users.

In addition, *Age* and *Gender & Sex* seem to be built on a certain research tradition, but *Ethnicity & Culture* and *Race* showed low numbers in all three years. A closer look reveals that the trend for all four dimensions is determined by the increase between 2011 and 2016 as no significant differences were found for 2006-2011. Thus, this development is more recent and will possibly gain even more momentum.

Physical Abilities have been addressed more often than *Mental Abilities*. In contrast to the multitude of subfields dealing with e.g. Accessibility, Health, or Learning and Education, both primary dimensions seem to have not received much overall attention in HCI studies yet. Beside their long history of stigmatization, people with mental disabilities are hard to reach and to convince for participation in a user study [59]. However, research on abilities is increasing, albeit non-significantly, and not only deals with disabilities but also includes this dimension in a broader, more general sense.

In case of the secondary diversity dimensions, solely the dimension of *Geographic Location* increased significantly over the considered years, while others remain nearly unexplored. The interest in information related to the *Geographic Location* has increased slowly, as only after a decade, i.e. between 2006 and 2016, a difference has become apparent. Keeping in mind the ongoing discussions about the WEIRD nature of HCI [92] and facing expanding digitalization over the globe, we expect the interest in this dimension will keep rising. It remains to be hoped that this will foster an increase in the attention for other, less considered, secondary dimensions such as *Class*, *Language & Accent* and *Migration Biography*.

Parental Status occurred in a rather low number of articles but a higher overall number of occurrences, implying that if the dimension is a matter of interest, it is considered in-depth. Mentioned in almost the same number of papers, *Relationship Status* is investigated in less intensity and thus, receives less attention. *Migration Biographies* and *Religion* show very low numbers in terms of papers as well as mentions. In addition, *Appearance & Body* do not receive in-depth investigations from a meta-perspective. These dimensions seem to be only side issues in HCI.

Thus, although the number of diversity dimensions occurrences increased, yet only a specific set of diversity dimensions is considered. We assume that these increases can be explained by a broader awareness of the concerns attributed to socio-political movements such as feminism and anti-racism (global and local), as well as demographic changes related to the average age of WEIRD societies.

Nevertheless, we have not yet reached the point of a full human-centered view on technology as only a limited set of dimensions is concerned in research – the roots of the discipline with its technology-centered perspectives are still observable. Even though the mentioned discussions seem to have had an impact on research, there is no broad consideration of all diversity dimensions from a meta-perspective. This assumption is underlined by the finding that within the analyzed body of CHI publications some dimensions have not even dealt with once. Of course, there is no way of considering all dimensions in one study or project, but as a research field as a whole, all dimensions and qualities should be addressed, regardless of their frequency [104], both at the theoretical and methodological levels. This consensus does not yet seem to have been achieved for the scientific discipline of HCI.

Fourth, our analyses showed that specific dimensions beyond those generally underrepresented in the HCI research received little attention especially in *H Information Systems*, which includes most papers. For example, even though the consideration of *Age* or *Ethnicity & Culture* has increased in terms of numbers of papers as well as occurrences, papers classified as *H Information Systems* do not keep up with this trend considering specific dimensions significantly less intensive compared to the other subfields. General trends for more awareness are not caused by specific subfields but overall developments. However, there is no clear relationship between the nature of the subfields and the diversity dimensions that find less attention. For example, *Race* or *Mental Abilities*, in fact, are as important to *H Information Systems* as for other subfields. Hence, we recommend that researchers take a close look at the particularities of their subfields and learn from other subfields.

6 RESEARCH IMPLICATIONS: WHAT AND HOW TO CONSIDER

In our attempt to assess how user diversity is addressed in research papers, our findings reveal both, an encouraging trend and at the same time a considerable backlog. We assume that in empirical studies and user involvement activities, the complexity of diversity and certain methodological challenges stand in the way of working diversity-sensitive. Yet, only few practical guidelines (e.g. [84]) exist on how to proceed with diversity aspects in user-based technology development and studies. We point to the need for progressive critical diversity research that goes beyond mere analysis toward creative methodological and theoretical implications

for diversity-sensitive research [7] [15] by reflecting on important questions including how to identify which dimensions are relevant and how to empirically capture these dimensions by drawing on interdisciplinary insights, foremost from sociological and psychological research, critical social theories, and best practice HCI research.

Identifying Relevant Diversity Dimensions

How to identify and select relevant diversity dimensions for a project is one of the biggest challenges when dealing with the complexity of diversity. Given that there is no universal answer to these questions, the elaboration process is highly depending on the scientific and technological context and is further modulated by individual research interests and circumstances. Diversity is characterized by multidimensionality, flexibility with regard to theoretical, empirical and practical applications, and multi-scalarity, i.e. exploring differences on a micro-, meso-, and macro-levels [17]. In line, exploring solely one dimension bears the risk of oversimplifications and of missing empirical facts [49]. Similarly, this might promote tendencies towards universalizing users and negating hierarchies and differences within a group (cf. [107] [109]). In line, simple additive analysis of diversity dimensions is not sufficient, because individuals experience social identities, e.g. being female and a person of color, not separately in everyday live [29]. Further, HCI research, which is committed to the tradition of critical diversity studies, has to explore differences between and within groups [17] and differences as well as similarities [97].

Although we are aware that it is practically not possible to consider all diversity dimensions explicitly when realizing HCI research and development, we stress that procedures for diversity-sensitive analyses are needed. In keeping distance from falling into stereotypes, it should be explained who is part of the user group(s) and which dimensions cannot be covered. Such understanding in the first place might lead to greater diversity of involved users, especially regarding the more neglected groups, and as a consequence, better quality of data.

Dimensions of relevance should be considered in all stages of a research and human-centered design process. Researchers and developers must explicitly ask themselves: which characteristics come to our mind when we imagine who we design for – and which characteristics are not reflected by our understanding of "the user(s)". Identifying ideas and needs for technological innovations might even start with users typically not in the focus of technology development. The collection of diversity dimensions presented in this paper can serve as a starting point for reflections.

Understanding and specifying the context of technology use is deeply interwoven with understanding people's everyday practices and identities. Contextual data should support the decision process at every stage of a human-centered development process. The strength of HCI researchers – who are familiar with iterative procedures and used to deal with unexpectedness – can also be applied to the consideration of diversity.

When specifying user requirements, we must ask for the relationship between diversity dimensions and technology usage. Even though asking for *specific* needs, we must keep the heterogeneity of social groups in mind, be careful when setting standards to avoid othering processes and to not reproduce hierarchical perceptions of what is the norm by e.g. comparing to "normal" users. Also, in the co-design and evaluation phase, we have to thoroughly review who takes part in user involvement activities. Thus, the question of how to collect diversity information in a diversity-sensitive way arises.

Collecting Diversity Information

HCI researchers are used to thinking in experiences when it comes to technology. Similarly, diversity can be thought of as lived experience [16] [78]. Therefore, we should consider the perspective of the group being studied [27]. Qualitative approaches can contribute to such non-a-priori definitions of dimensions including their quality and relevance. By aiming at understanding users, multidimensional contributions of diversity dimensions can be met. However, such a recommendation does not neglect quantitative or mixed-method approaches [94]. Multi-method designs are necessary to deeply account for the complexity. Dimensions can be operationalized by a mix of bottom-up, e.g. qualitative data by the user, and top-down decisions, e.g. theory-based definitions by researchers [78].

Analyzing data in a diversity-sensitive way means to identify differences without overemphasizing, naturalizing and homogenizing [25] [107]. We should seek for similarities to other groups as well as differences within a group [27] [97], especially if we aim to give voice to marginalized groups [25]. For quantitative research, this means not solely assuming main effects, but to search for interactions [25]. Explorative data analysis and multilevel models can account for such strategies [25] [71].

In the following sections, we recommend strategies for diversity-sensitive data collection. The list does not claim to be exhaustive but is intended to stimulate research.

Draw Attention to Self-Definition and Practices of Users. In user interviews, we recommend drawing attention to users' self-definition and practices instead of providing them predetermined answering options. To give an example, in an adapted version of the Multigroup Ethnic Identity Measure applied in [77] participants answered questions about their cultural affiliation. Items included, "I participate in cultural

practices of my own group, such as special food, music, or customs" and thus refer to the practice of *Ethnicity & Culture*.

In case multiple choice questions are the preferred format, minor adaptations can be made to enhance data quality. For instance, in a study on social media challenges for individuals during gender identity transitions [47], participants could choose multiple binary as well as non-binary gender identities to describe themselves. In another study, Hogan et al. [56] did not only ask participants if they are "gay", "bisexual" or "queer" but also gave the option to state that they had sex with other men. By this, people who do not see sexual practices as an explicit part of their identity ("being something") are addressed. In addition, when applying closed-ended questions, we advise providing answering options such as "unsure" and free text entry options to favor the collection of self-definitions.

Look at Diversity in Context. Conducting research that is diversity-sensitive implies researching context-aware [17]. For example, the dimension of *Race* can be operationalized by means of the Multidimensional Model of Racial Identity [85] which suggests salience and centrality in addition to regard and ideology as dimensions of African American racial identity. Thus, the social environment might be included to cover such aspects [49]. Similarly, so-called other-referent age scales (e.g. asking participants to assess if they are older or younger compared to other persons of their age) show better validity in cross-cultural studies [11].

Social context and geographical environment might also be relevant in a closer matter. Investigating device and account sharing, Matthews et al. [70] focused on households, parent-child relationships, and children's age. Household incomes also serve as a better indicator than individual income [89] for *Class*. Interdisciplinary research shows that *Class* could be also explored covering data on how individuals see themselves in comparison to others in terms of having more or less money, education, and respected jobs [6].

Thus, context might refer to the physical environment, generalized other persons of a society, or family, friends, and peers, but also to non-local, even transnational dynamics, connections and interrelations [16].

Detail dimensions along their multifaceted qualities. We recommend exploring relevant dimensions in detail, respectively including multiple layers and describing exactly what is intended to capture. This may seem trivial but is especially of relevance when dealing with supposedly obvious dimensions. For example, applying the typical dichotomy male-female to characterize study participants leads to neglect the larger spectrum of the dimension, but favors the generation of biased empirical insights by passing on stereotypes about (cis)gender and underestimating other factors and relations [34]. *Age* is usually defined as the number of years a person is living but should be described as a quadruplicate process (i.e. chronological, biological, psychological, social *Age*) [57]. Similarly, Johnson and colleagues [60] first investigated what localness, an aspect of *Geographic Location*, means in geotagged social media, and proposed four detailed localness approaches.

Moreover, we agree with Hancock [49] who advise applying fuzzy set logic, i.e. understanding membership as continuous degrees of affiliation. In line, focusing on specific qualities of dimensions can lead to a reproduction of worldviews that place male, white, heterosexual etc. persons at the center. For example, if women are studied solely, this might convey the impression the diversity dimension *Gender* does not matter to men. In this way, humans with certain characteristics might be regarded as the norm or "normal". As for HCI, such practices should be omitted to beware from designing gender biased technology in future generations [12]. Similarly, when privileged individuals research, applying categories can bear the risk of labeling users as "the other" [93] and thus, reproducing paternalistic views and hierarchical lines of difference instead of amplifying voices.

Altogether, it is not only important which dimensions receive attention but also how these categories are applied. Especially when working in areas or with users that are inherently foreign to the researchers requires deep reflection efforts on the personal backgrounds and biases [33].

Be creative and seek for indirect ways of data collection. In some methodological designs, the acquisition of certain data is not foreseen or easily feasible. In such cases, researchers are encouraged to be creative and seek for indirect means for the identification and capture of dimensions. For example, *Geographic Location* can be identified by screening IP addresses in online surveys [95]. Sometimes, participants are willing but not able to report desired information. For instance, investigating experiences of memory loss, Ramos et al. [81] applied a sophisticated research design for investigating this aspect of *Mental Abilities*: diaries served as indirect observation methods, discussion rounds were organized to give participants voice and gather perceptions, and a lot of effort was spent on supporting participants in feeling comfortable, at ease and safe.

Explore relationships to concrete technology. The results of the content analysis clearly show that some diversity dimensions are hardly considered at all. One reason might be that sometimes, as noted by Haimson et al. [46], the sensitivity of a research topic causes hesitation among researchers to ask for personal information. Consequently, no data is collected despite the relevance of a diversity dimension for answering the research question and essential questions remain unanswered. Working with human participants, scientific practitioners need to be aware of and respect people's willingness

to disclose personal information. We emphasize that only information that is needed for answering research questions should be gathered. Nevertheless, we have to pay attention to underexplored dimensions to enable empirically grounded decisions on what might be meaningful and important.

The relevance of diversity dimensions needs to be elaborated along their relationship to concrete technology use. For instance, considering *Physical Abilities*, for some studies, visual abilities might be less important compared to the fact if participants use a screen reader [75] or use Braille [86]. In general, instruments could be used to screen a study sample for *Mental* and/or *Physical Abilities*, e.g. by performing a hearing screening when evaluating speech interfaces, or a vision test to minimize interferences of vision acuity in relation with graphical interfaces.

7 CONCLUSION

We propose a collection of diversity dimensions for a more comprehensive perspective on the representation of user diversity. Our results show, that despite an encouraging trend regarding more in-depth considerations of users, researchers still examine a limited number and set of dimensions. Thus, we still have to work on the development from a technology-centered towards a more human-centered view on HCI.

Taking diversity-sensitive research practices into account enables comprehensive insights and enhanced validity of empirical results. Such approaches serve as a corrective for overemphasizing generalizability [49]. Diversity-sensitivity puts the user including facets of identity, context of use and everyday experiences in the center of HCI and thus enables human-centered and context-aware technology design. To achieve this, we argued that reflection is essential. We can build on our approaches to be simultaneously creative and strategic in our work and apply iterative processes. By that, researchers can figure out which methodology and theory make sense for them, their objectives and, more importantly, why specific considerations are meaningful for their purpose.

The presented approaches should contribute to overcome the identified research gaps. Nevertheless, we do not claim completeness but acknowledge that a collection of diversity dimensions is – just like identity – "a 'production', which is always in process, and constituted within, not outside representation" [48]. Therefore, we must proceed with reflection and continuously supplement and revise our understanding of diversity. By providing a collection as a starting point, we encourage authors to critically review the dimensions from theoretical, practical and activist movement perspectives.

In this paper, we focused on established and general dimensions, without considering technology-related facets. For future research, we plan and suggest adding new layers to the collection including, for example, dispositional factors such as technology affinity and experience with technology.

To capture the examined dimensions, a selected set of respective keywords was used for the coding procedure. The involvement of HCI experts with publication experience in an validation workshop reduced the risk of missing relevant keywords and aspects. Even though the analysis revealed viable insights on whether dimensions have been considered, we did not analyze which theoretical approaches were applied. Accordingly, future research should assess if the applied theories and operationalizations account for the complexity of the dimensions.

The analysis comprised publication year and HCI subfields as independent variables. Being aware that HCI is not an isolated system, there are theoretically more elaborate ways of investigating research practices. Discourse theories [42] could be applied to think about power-knowledge relationships or system theories [67] might offer insights regarding patterns, self-regulation, and adaptations. Future work should also strive to analyze the relationships between occurrences of diversity dimensions in research, as well as to identify clusters of diversity dimensions in order to learn more about whether and which dimensions are predominantly addressed together. Such in-depth analysis could encourage the adoption of a more differentiated understanding of the diversity of user populations within the HCI community.

Finally, dealing with diversity, we have to reflect on our own situatedness [51] and resulting perspectives. As the authors of the current research, we regard ourselves as privileged individuals in terms of most of the proposed diversity dimensions. In our research activities, we follow the principle that human existence and human dignity regardless of the quality of the proposed diversity dimensions must be regarded as meaningful and defensible and thus, technology must account for all user groups and contribute to limiting inequalities. Nevertheless, we have been shaped by living in WEIRD areas. Thus, we foremost are aware that diversity dimensions which are regarded as important in this work are influenced by our social context. We hope non-WEIRD researchers critically revise the collection of dimensions.

Overall, we are aware that HCI research practice itself is diverse and this is a strength of the interdisciplinary field. Hence, we do not regard our approach as the only way of diversity-sensitive research. In contrast, we hope to learn more about other views and that our investigation contributes to the ongoing reflection and discussion.

ACKNOWLEDGMENTS

We thank Sophie Melzer for her reliable, careful and patient coding efforts and Anne-Sophie Schefczik for her support in screening the papers for best practice examples. We thank the experts for their time and valuable input in the workshop and the reviewers for their thoughtful comments.

REFERENCES

[1] 2006. *CHI '06: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA.

[2] 2011. *CHI '11: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA.

[3] 2016. *CHI '16: Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA.

[4] 2017. ATLAS.ti: The Qualitative Data Analysis Research Software. https://atlasti.com/

[5] ACM Digital Library. 2018. Conferences. CHI Conference on Human Factors in Computing Systems. https://dl.acm.org/event.cfm?id=RE151

[6] Nancy Adler and Judith Stewart. 2007. The MacArthur Scale of Subjective Social Status Summary.

[7] Margaret L Andersen. 2001. Restructuring for Whom? Race, Class, Gender, and the Ideology of Invisibility. *Sociological Forum* 16, 2 (2001), 181–201.

[8] Jeffrey J. Arnett. 2008. The Neglected 95%: Why American Psychology Needs to Become Less American. *American Psychologist* 63, 7 (2008), 602–614. https://doi.org/10.1037/0003-066X.63.7.602

[9] Association for Computing Machinery. 2007. The ACM Computing Classification System (1998). https://www.acm.org/publications/computing-classification-system/1998/ccs98

[10] Liam Bannon. 2011. Reimagining HCI: toward a more human-centered perspective. *interactions* 18, 4 (2011), 50. https://doi.org/10.1145/1978822.1978833

[11] Benny Barak. 2009. Age identity: A cross-cultural global approach. *International Journal of Behavioral Development* 33, 1 (2009), 2–11. https://doi.org/10.1177/0165025408099485

[12] Louise Barkhuus and Jennifer A Rode. 2007. From Mice to Men – 24 years of Evaluation in CHI. In *Extended Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 1–16. https://doi.org/10.1145/1240624.2180963

[13] John Barnshaw. 2008. Race. In *Encyclopedia of Race, Ethnicity, and Society*, Richard T Schaefer (Ed.). SAGE Publications, Thousand Oaks, 1091–1093.

[14] Frederik Barth. 1969. *Ethnic Groups and Boundaries. The Social Organization of Culture Difference*. Little, Brown and Company, Boston.

[15] Joyce M Bell and Douglas Hartmann. 2007. Diversity in everyday discourse: Consequences of "happy talk". *American Sociological Review* 72, 1997 (2007), 895–914. https://doi.org/10.1177/000312240707200603

[16] Mette Louise Berg and Nando Sigona. 2013. Ethnography, diversity and urban space. *Identities* 20, 4 (2013), 347–360. https://doi.org/10.1080/1070289X.2013.822382

[17] Paolo Boccagni. 2015. The Difference Diversity Makes: A Principle, a Lens, an Empirical Attribute for Majority–Minority Relations. *Governing through Diversity* (2015), 21–38.

[18] Susanne Bødker. 2006. When second wave HCI meets third wave challenges. In *Proceedings of the 4th Nordic conference on Human-computer interaction changing roles - NordiCHI '06*. ACM Press, New York, New York, USA, 1–8. https://doi.org/10.1145/1182475.1182476

[19] Meg A. Bond and Tean L. Pyle. 1998. Diversity Dilemmas at Work. *Journal of Management Inquiry* 7, 3 (1998), 252–269. https://doi.org/10.1177/105649269873007

[20] Juanita Brown and David Isaacs. 2006. *The World Café: Shaping Our Futures Through Conversations That Matter*. Berrett-Koehler Publishers Inc, San Francisco.

[21] Duncan P Brumby, Dario D Salvucci, and Andrew Howes. 2009. Focus on driving: How Cognitive Constraints Shape the Adaptation of Strategy when Dialing while Driving. In *Proceedings of the 27th international conference on Human factors in computing systems - CHI 09*. ACM Press, New York, New York, USA, 1629. https://doi.org/10.1145/1518701.1518950

[22] Kelly Caine. 2016. Local Standards for Sample Size at CHI. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 981–992. https://doi.org/10.1145/2858036.2858498

[23] Xiang Cao, Abigail Sellen, A.J. Bernheim Brush, David Kirk, Darren Edge, and Xianghua Ding. 2010. Understanding family communication across time zones. In *Proceedings of the 2010 ACM conference on Computer supported cooperative work - CSCW '10*. ACM Press, New York, New York, USA, 155. https://doi.org/10.1145/1718918.1718947

[24] Jessie Chin, Wai-Tat Fu, and Thomas Kannampallil. 2009. Adaptive information search: Age-Dependent Interactions between Cognitive Profiles and Strategies. In *Proceedings of the 27th international conference on Human factors in computing systems - CHI 09*. ACM Press, New York, New York, USA, 1683. https://doi.org/10.1145/1518701.1518961

[25] Hae Yeon Choo and Myra Marx Ferree. 2010. Practicing Intersectionality in Sociological Research: A Critical Analysis of Inclusions, Interactions, and Institutions in the Study of Inequalities. *Sociological Theory* 28, 2 (2010), 129–149. https://doi.org/10.1111/j.1467-9558.2010.01370.x

[26] Derrick L. Cogburn. 2003. HCI in the so-called developing world: what's in it for everyone. *Interactions* 10, 2 (2003), 80–87. https://doi.org/10.1145/637848.637866

[27] Elizabeth R Cole. 2009. Intersectionality and research in psychology. *American Psychologist* 64, 3 (2009), 170–180. https://doi.org/10.1037/a0014564

[28] Ann Colley and Chris Comber. 2003. Age and gender differences in computer use and attitudes among secondary school students: What has changed? *Educational Research* 45, 2 (2003), 155–165. https://doi.org/10.1080/0013188032000103235

[29] Patricia Hill Collins. [n. d.]. Toward a new vision: Race, class, and gender as categories of analysis and connection. In *Women's Voices, Feminist Visions. Classic and Contemporary Readings*, Susan M Shaw and Janet Lee (Eds.). McGraw-Hill, Boston, 72–79.

[30] Sabrina L. Connell, Alexis R. Lauricella, and Ellen Wartella. 2015. Parental co-use of media technology with their young children in the USA. *Journal of Children and Media* 9, 1 (2015), 5–21. https://doi.org/10.1080/17482798.2015.997440

[31] Sara J Czaja, Neil Charness, Arthur D Fisk, Christopher Hertzog, Sankaran N Nair, Wendy A Rogers, and Joseph Sharit. 2006. Factors predicting the use of technology: Findings from the center for research and education on aging and technology enhancement (CREATE). *Psychology and Aging* 21, 2 (2006), 333–352. https://doi.org/10.1037/0882-7974.21.2.333

[32] Pamela E Davis-Kean. 2005. The Influence of Parent Education and Family Income on Child Achievement: The Indirect Role of Parental Expectations and the Home Environment. *Journal of Family Psychology* 19, 2 (2005), 294–304. https://doi.org/10.1037/0893-3200.19.2.294

[33] Nicola Dell and Neha Kumar. 2016. The Ins and Outs of HCI for Development. ACM Press, 2220–2232. https://doi.org/10.1145/2858036.2858081

[34] Francine M. Deutsch. 2007. Undoing gender. *Gender and Society* 21, 1 (2007), 106–127. https://doi.org/10.1177/0891243206293577

[35] Jonathan Donner. 2008. Research approaches to mobile use in the developing world: A review of the literature. *Information Society* 24, 3 (2008), 140–159. https://doi.org/10.1080/01972240802019970

[36] Susan M. Dray, David a. Siegel, and Paula Kotzé. 2003. Indra's net HCI in the developing World. *Interactions* (2003), 28–37.

[37] Lauren B. Edelman, Sally Riggs Fuller, and Iona Mara-Drita. 2001. Diversity Rhetoric and the Managerialization of Law. *Amer. J. Sociology* 106, 6 (2001), 1589–1641. https://doi.org/10.1086/321303

[38] Robin J Ely. 1995. The Power in Demography: Women's Social Constructions of Gender Identity at Work. *Academy of Management*

Journal 38, 3 (1995), 589–634.

[39] Sheena Erete, Aarti Israni, and Tawanna Dillahunt. 2018. An intersectional approach to designing in the margins. *Interactions* 25, 3 (apr 2018), 66–69. https://doi.org/10.1145/3194349

[40] Eurostat. [n. d.]. Internet use by individuals. https://ec.europa.eu/eurostat/tgm/table.do?tab=table{&}init=1{&}language=en{&}pcode=tin00028{&}plugin=1

[41] Thomas Faist. 2009. Diversity - A new mode of incorporation? *Ethnic and Racial Studies* 32, 1 (2009), 171–190. https://doi.org/10.1080/01419870802483650

[42] Michel Foucault. 1978. *The Will to Knowledge: The History of Sexuality. An Introduction.* Pantheon Books, New York, New York, USA.

[43] L Gardenswartz and A Rowe. 2003. *Diverse Teams at Work: Capitalizing on the Power of Diversity.* Society for Human Resource Management, Alexandria, Va. https://doi.org/10.1017/CBO9781107415324.004

[44] David Gefen and Detmar W Straub. 1997. Gender Differences in the Perception and Use of E-Mail: An Extension to the Technology Acceptance Model. *MIS Quarterly* 21, 4 (1997), 389. https://doi.org/10.2307/249720

[45] Google Scholar Metrics. 2018. Top publications: Human Computer Interaction. https://scholar.google.es/citations?view_op=top_venues&hl=en&vq=eng_humancomputerinteraction

[46] Oliver L Haimson, Anne E Bowser, Edward F Melcer, and Elizabeth F Churchill. 2015. Online Inspiration and Exploration for Identity Reinvention. In *CHI '15 - Proceedings of the ACM Conference on Human Factors in Computing Systems*, Vol. 1. 3809–3818. https://doi.org/10.1145/2702123.2702270

[47] Oliver L. Haimson, Jed R. Brubaker, Lynn Dombrowski, and Gillian R. Hayes. 2016. Digital Footprints and Changing Networks During Online Identity Transitions. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. ACM Press, New York, New York, USA, 2895–2907. https://doi.org/10.1145/2858036.2858136

[48] Stuart Hall. 1999. Cultural Identity and Diaspora. In *Diaspora and Visual Culture. Representing Africans and Jews*, Nicholas Mirzoeff (Ed.). Routledge, London, 222–237.

[49] Ange-Marie Hancock. 2007. When Multiplication Doesn't Equal Quick Addition: Examining Intersectionality as a Research Paradigm. *Perspectives on Politics* 5, 01 (mar 2007), 63–79. https://doi.org/10.1017/S1537592707070065

[50] David Hankerson, Andrea R. Marshall, Jennifer Booker, Houda El Mimouni, Imani Walker, and Jennifer A. Rode. 2016. Does Technology Have Race?. In *CHI EA '16 Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. San Jose, California, USA, 473–486. https://doi.org/10.1145/2851581.2892578

[51] Donna Haraway. 1988. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies* 14, 3 (1988), 575–599. https://doi.org/10.2307/3178066

[52] Steve Harrison, Deborah Tatar, and Phoebe Sengers. 2007. The three paradigms of HCI. *Alt. Chi. Session at the SIGCHI ...* January (2007), 1–18. https://doi.org/10.1234/12345678

[53] Joseph Henrich, Steven J. Heine, and Ara Norenzayan. 2010. Most people are not WEIRD. *Nature* 466, 7302 (jul 2010), 29–29. https://doi.org/10.1038/466029a

[54] Joseph Henrich, Steven J Heine, and Ara Norenzayan. 2010. The weirdest people in the world? *Behavioral and Brain Sciences* 33, 2-3 (2010), 61–83. https://doi.org/10.1017/S0140525X0999152X

[55] Cedric Herring and Loren Henderson. 2012. From Affirmative Action to Diversity: Toward a Critical Diversity Perspective. *Critical Sociology* 38, 5 (2012), 629–643. https://doi.org/10.1177/0896920511402701

[56] Bernie Hogan, Joshua R. Melville, Gregory Lee Phillips II, Patrick Janulis, Noshir Contractor, Brian S. Mustanski, and Michelle Birkett. 2016. Evaluating the Paper-to-Screen Translation of Participant-Aided Sociograms with High-Risk Participants. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 5360–5371. https://doi.org/10.1145/2858036.2858368

[57] Nancy R Hooyman and H Asuman Kiyak. 2008. *Social Gerontology: A Multidisciplinary Perspective.* Pearson/Allyn & Bacon, Boston.

[58] Linda A. Jackson, Yong Zhao, Anthony Kolenic, Hiram E. Fitzgerald, Rena Harold, and Alexander Von Eye. 2008. Race, Gender, and Information Technology Use: The New Digital Divide. *CyberPsychology & Behavior* 11, 4 (2008), 437–442. https://doi.org/10.1089/cpb.2007.0157

[59] Stefan Johansson, Jan Gulliksen, and Ann Lantz. 2015. User Participation When Users Have Mental and Cognitive Disabilities. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility (ASSETS '15)*. ACM, New York, NY, USA, 69–76. https://doi.org/10.1145/2700648.2809849

[60] Isaac L. Johnson, Subhasree Sengupta, Johannes Schöning, and Brent Hecht. 2016. The Geography and Importance of Localness in Geotagged Social Media. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 515–526. https://doi.org/10.1145/2858036.2858122

[61] Heli Koski and Tobias Kretschmer. 2007. Catching up? Differences in 2G mobile diffusion in industrialized and developing countries. 66 (2007), 7.

[62] Neha Kumar, Eunice Sari, William Thies, Indrani Medhi-Thies, William D. Tucker, Elba Valderrama Bahamondez, Susan Wyche, Susan Dray, Andy Dearden, Nicola Dell, Melissa Densmore, Rebecca E. Grinter, Zhengjie Liu, Mario A. Moreno Rocha, and Anicia Peters. 2016. Development Consortium: HCI Across Borders. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '16*. ACM Press, New York, New York, USA, 3620–3627. https://doi.org/10.1145/2851581.2856507

[63] Kari Kuutti. 2001. Hunting for the lost user : From sources of errors to active actors – and beyond. In *Paper presented at Cultural Usability Seminar, Media Lab, University of Art and Design.* Media Lab, University of Art and Design Helsinki.

[64] Nai Li and Gill Kirkup. 2007. Gender and cultural differences in Internet use: A study of China and the UK. *Computers & Education* 48, 2 (2007), 301–317. https://doi.org/10.1016/j.compedu.2005.01.007

[65] Yang Li and James A. Landay. 2008. Activity-based prototyping of ubicomp applications for long-lived, everyday human activities. In *Proceeding of the twenty-sixth annual CHI conference on Human factors in computing systems - CHI '08*. ACM Press, New York, New York, USA, 1303. https://doi.org/10.1145/1357054.1357259

[66] Marilyn Loden and Judy B Rosener. 1991. *Workforce America! Managing Employee Diversity As a Vital Resource.* Business One Irwin, Homewood.

[67] Niklas Luhmann. 1995. *Social Systems.* Stanford University Press, Stanford, California, USA.

[68] Helma Lutz and Norbert Wennig. 2001. Differenzen über Differenz – Einführung in die Debatten. In *Unterschiedlich verschieden : Differenz in der Erziehungswissenschaft*, Helma Lutz and Norbert Wennig (Eds.). Leske + Budrich, Opladen, 11–24. https://doi.org/10.1007/978-3-663-11705-6

[69] Mary Madden and Lee Rainie. 2003. America's Online Pursuits. http://www.pewinternet.org/2003/12/22/americas-online-pursuits/internal-pdf://0.0.0.70/americas-online-pursuits.html

[70] Tara Matthews, Kerwell Liao, Anna Turner, Marianne Berkovich, Robert Reeder, and Sunny Consolvo. 2016. "She'll just grab any device that's closer": A Study of Everyday Device & Account Sharing in Households. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. ACM Press, New York, New

York, USA, 5921–5932. https://doi.org/10.1145/2858036.2858051

[71] Leslie Mccall. 2005. The Complexity of Intersectionality. *Signs: Journal of Women in Culture and Society* 30, 3 (2005), 1771–1800.

[72] John McCarthy and Peter Wright. 2004. *Technology as experience*. MIT Press, Cambridge, Mass. http://portal.acm.org/citation.cfm?doid=1015530.1015549

[73] Tracy L Mitzner, Julie B Boron, Cara Bailey Fausset, Anne E Adams, Neil Charness, Sara J Czaja, Katinka Dijkstra, Arthur D Fisk, Wendy A Rogers, and Joseph Sharit. 2010. Older adults talk technology: Technology usage and attitudes. *Computers in Human Behavior* 26, 6 (2010), 1710–1721. https://doi.org/10.1016/j.chb.2010.06.020

[74] M G Morris, V Venkatesh, and P L Ackerman. 2005. Gender and Age Differences in Employee Decisions About New Technology: An Extension to the Theory of Planned Behavior. *IEEE Transactions on Engineering Management* 52, 1 (2005), 69–84. https://doi.org/10.1109/TEM.2004.839967

[75] Meredith Ringel Morris, Annuska Zolyomi, Catherine Yao, Sina Bahram, Jeffrey P. Bigham, and Shaun K. Kane. 2016. "With most of it being pictures now, I rarely use it": Understanding Twitter's Evolving Accessibility to Blind Users. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. ACM Press, New York, New York, USA, 5506–5516. https://doi.org/10.1145/2858036.2858116

[76] Pew Research Center. [n. d.]. Demographics of Mobile Device Ownership and Adoption in the United States. http://www.pewinternet.org/fact-sheet/mobile/

[77] Jean S Phinney. 1992. The Multigroup Ethnic Identity Measure: A New Scale for Use with Diverse Groups. *Journal of Adolescent Research* 7, 2 (apr 1992), 156–176. https://doi.org/10.1177/074355489272003

[78] Ann Phoenix. 2006. Interrogating intersectionality: Productive ways of theorising multiple positioning. *Kvinder, Køn & Forskning* 2-3 (jun 2006), 21–30. https://doi.org/10.7146/kkf.v0i2-3.28082

[79] James W Potter and Deborah Levine-Donnerstein. 1999. Rethinking validity and reliability in content analysis. *Journal of Applied Communication Research* 37, 3 (1999), 258–284. https://doi.org/10.1080/00909889909365539

[80] Pushkala Prasad, Judith K Pringle, and Alison M Konrad. 2006. Examining the contours of workplace diversity: concepts, contexts and challenges. In *Handbook of Workplace Diversity*, Pushkala Prasad, J Pringle, and A Konrad (Eds.). SAGE Publications Ltd, London, 1–22. https://doi.org/10.4135/9781848608092

[81] Laura Ramos, Elise van den Hoven, and Laurie Miller. 2016. Designing for the Other 'Hereafter'. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 721–732. https://doi.org/10.1145/2858036.2858162

[82] Katharina Reinecke and Krzysztof Z Gajos. 2014. Quantifying visual preferences around the world. ACM Press, 11–20. https://doi.org/10.1145/2556288.2557052

[83] Julie Rico and Stephen Brewster. 2009. Gestures all around us: user differences in social acceptability perceptions of gesture based interfaces. In *Proceedings of the 11th International Conference on Human-Computer Interaction with Mobile Devices and Services - MobileHCI '09*. ACM Press, New York, New York, USA, 1. https://doi.org/10.1145/1613858.1613936

[84] Ari Schlesinger, W. Keith Edwards, and Rebecca E. Grinter. 2017. Intersectional HCI: Engaging Identity through Gender, Race, and Class. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 5412–5427. https://doi.org/10.1145/3025453.3025766

[85] Robert M. Sellers, Mia A Smith, J. Nicole Shelton, Stephanie AJ Rowley, and Tabbye M Chavous. 1998. Multidimensional Model of Racial Identity: A Reconceptualization of African American Racial Identity. *Personality and Social Psychology Review* 2, 1 (feb 1998), 18–39. https://doi.org/10.1207/s15327957pspr0201_2

[86] Lei Shi, Idan Zelzer, Catherine Feng, and Shiri Azenkot. 2016. Tickers and Talker: An Accessible Labeling Toolkit for 3D Printed Models. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 4896–4907. https://doi.org/10.1145/2858036.2858507

[87] Kiley Sobel. 2017. Equity & Inclusivity at IDC. Idc (2017), 761–767.

[88] Gayatri Chakravorty Spivak. 1985. The Rani of Sirmur: An Essay in Reading the Archives. *History and Theory* 24, 3 (1985), 247–272.

[89] Mark Staton, Neeru Paharia, and Christopher Oveis. 2012. Emotional marketing: How pride and compassion impact preferences for underdog and top dog brands. *Advances in Consumer Research* 40, December 2009 (2012), 1045–1046. https://doi.org/10.1037/a0016357

[90] Detmar Straub, Mark Keil, and Walter Brenner. 1997. Testing the technology acceptance model across cultures: A three country study. *Information & Management* 33, 1 (1997), 1–11. https://doi.org/10.1016/S0378-7206(97)00026-8

[91] Angelika Strohmayer, Rosanna Bellini, Janis Meissner, Samantha Mitchell Finnigan, Ebtisam Alabdulqader, Austin Toombs, and Madeline Balaam. 2018. #CHIversity. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems - CHI '18* (2018), 1–10. https://doi.org/10.1145/3170427.3188396

[92] Christian Sturm, Alice Oh, Sebastian Linxen, Jose Abdelnour Nocera, Susan Dray, and Katharina Reinecke. 2015. How WEIRD is HCI?: Extending HCI Principles to other Countries and Cultures. *Extended Abstracts of the ACM CHI'15 Conference on Human Factors in Computing Systems* 2 (2015), 2425–2428. https://doi.org/10.1145/2702613.2702656

[93] Huatong Sun and William F Hart-davidson. 2014. Binding the Material and the Discursive with a Relational Approach of Affordances. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. Toronto, Ontario, Canada, 3533–3542.

[94] Moin Syed. 2010. Disciplinarity and methodology in intersectionality theory and research. *American Psychologist* 65, 1 (2010), 61–62. https://doi.org/10.1037/a0017495

[95] Leila Takayama, Wendy Ju, and Clifford Nass. 2008. Beyond dirty, dangerous and dull: What Everyday People Think Robots Should Do. In *Proceedings of the 3rd international conference on Human robot interaction - HRI '08*. ACM Press, New York, New York, USA, 25. https://doi.org/10.1145/1349822.1349827

[96] Serigne Mansour Tall. 2004. Senegalese 'emigrés : New information & communication technologies. *Review of African Political Economy* 31, 99 (2004), 31–48.

[97] R Roosevelt Thomas. 1996. *Redefining diversity*. American Management Association, New York.

[98] Kenneth Turner and Marilyn McGee-Lennon. 2013. Advances in telecare over the past 10 years. *Smart Homecare Technology and TeleHealth* 1 (nov 2013), 21. https://doi.org/10.2147/SHTT.S42674

[99] Jutta Überacker and Austrian Society for Diversity (ASD). 2010. *Diversity Management (DM) im Überblick*. Technical Report. Cited. www.societyfordiversity.at

[100] Anne R. van Ewijk. 2011. Diversity and diversity policy: Diving into fundamental differences. *Journal of Organizational Change Management* 24, 5 (2011), 680–694. https://doi.org/10.1108/09534811111158921

[101] Steven Vertovec. 2012. "Diversity" and the Social Imaginary. *European Journal of Sociology* 53, 03 (dec 2012), 287–312. https://doi.org/10.1017/S000397561200015X

[102] Max Weber. 1978. *Economy and society*. University of California Press, Berkeley, Los Angeles, London. https://doi.org/10.1017/CCOL0521818389.011

[103] Gabriele Winker and Nina Degele. 2011. Intersectionality as multi-level analysis: Dealing with social inequality. *European Journal of Women's Studies* 18, 1 (feb 2011), 51–66. https://doi.org/10.1177/1350506810386084

[104] Pamela Wisniewski, Geraldine Fitzpatrick, and Michael Muller. 2018. Intersectionality as a Lens to Promote Equity and Inclusivity within SIGCHI. *In Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems, p. panel08. ACM,* (2018), 1–6. https://doi.org/10.1145/3170427.3186324

[105] Paweł Woźniak, Kristina Knaving, Staffan Björk, and Morten Fjeld. 2015. RUFUS: Remote Supporter Feedback for Long-Distance Runners. In *Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services - MobileHCI '15*. ACM Press, New York, New York, USA, 115–124. https://doi.org/10.1145/2785830.2785893

[106] Sarita Yardi and Amy Bruckman. 2012. Income, race, and class: exploring socioeconomic differences in family technology use. ACM Press, 3041. https://doi.org/10.1145/2207676.2208716

[107] Patrizia Zanoni and Marta Calas. 2014. Diversity and Organizations. *Organization* Special Vi (2014), 1–8.

[108] Patrizia Zanoni and Maddy Janssens. 2004. Deconstructing Difference: The Rhetoric of Human Resource Managers' Diversity Discourses. *Organization Studies* 25, 1 (2004), 55–74. https://doi.org/10.1177/0170840604038180

[109] Patrizia Zanoni, Maddy Janssens, Yvonne Benschop, and Stella Nkomo. 2010. Unpacking Diversity, Grasping Inequality: Rethinking Difference Through Critical Perspectives. *Organization* 17, 1 (jan 2010), 9–29. https://doi.org/10.1177/1350508409350344