Networks of care in digital domestic labour economies

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ABSTRACT

Care work has long been relegated to private households and small communities, however, with the entry of digital marketplaces, it is becoming part of public economic spheres. While care work has been generally devalued and understudied, it is a complex practice embedded in a network of economic transactions, social relations, material conditions, and socio-cultural norms. This paper explores the care giving networks among migrant house-cleaners guided by Tronto's 'care ethics' and Puig de la Bellacasa's 'matters of care'. We interviewed 19 Latino house-cleaners in Toronto to understand their care practices and networks. Our analysis identifies gaps in our participants' care networks. We create a new term, lateral care, to explicate the digital communities of care practice our participants formed. We conclude with implications for the future design of technologies for labor economies that attend to concerns of care.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in HCI**.

KEYWORDS

care, migrant labor, digital communities, Feminist HCI

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1 INTRODUCTION

With the introduction of new technologies, the landscape of labor continues to transform in novel ways. Human-Computer Interaction (HCI) scholarship has done much investigation on new digital platforms such as on-demand work platforms [119], ride-share applications [27, 74, 76], and food delivery systems [119, 142]. While these platforms provide novel ways for people to find work, they also create harm and exacerbate power dynamics, particularly for people with marginalized identities. While work has been done on labor economies in the public sphere [54, 72, 104, 144], limited work has examined the private sphere traditionally associated with women and domesticity (i.e., child/elder care, cooking, housecleaning). In labor economies associated with the private sphere, power dynamics akin to those in the public sphere arise, in addition to the systemic devaluation of domestic labor [52]. In this paper, we explore how Latino[1] house-cleaners in Toronto experience power differentials in networks of care on platforms where they source care work employment, and find ways to fill gaps in their own care needs.

While care is often presented as a practice privately enacted solely by members of the household, privileged families have long outsourced care labor such as housecleaning to external provider in public markets of care. Care has also been framed as a two-actor, or dyadic, relationship, such as between mother and child, care worker and client, or doctor and patient [134]. HCI literature has often focused on dyadic relations mediated by technologies, with the support of technologies which they use to enact care [21, 49, 53, 69, 73, 82, 118, 138]. However, care is in fact a networked practice which touches a wide matrix of actors. Indeed, care literature in HCI has already engaged with the networked nature of care [42, 65, 89, 110].

Our study is further motivated by the increasing move of care services into digital spaces. On one hand, digital market platforms such as Care.com and SitterCity [1, 3] are attempting to platformize informality, and on the other, informal marketplaces are creating spaces for unofficial care work service exchange. Previous scholarship has argued that domestic work is informal market labor as it has always been less regulated and more on-demand than labor performed in the 'public sphere' [98]. Consequently, digital market platforms for care have not reached the same scale as other gig work has, such as food delivery and ride services. Instead, even on digital spaces, care work arrangements continue to be mediated by networked personal connections and/or informal marketplaces [52]. The importance of digital spaces in mediating care labor exchanges and the historical devaluation of care work and associated harms,

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[1]For the purposes of this paper we will use "Latino" to refer to mixed-gender groups of people from Central and South American countries who self-identify as Latino. We chose this language to align with the language used by our participants.

underscore the crucial responsibility of designers as actors in the networks of care in shaping future labor economies.

To understand the interplay of technological spaces and the nature of care work through networks of care in housecleaning, and derive implications for design for care, we interviewed 19 Latino house-cleaners in Toronto to understand their care practices and relationships. Our analysis identifies gaps in our participants' care networks and issues with the current state of care ethics in informal domestic labor markets. Our research explores the intersection of several understudied areas in HCI: gendered labor, immigrant labor, informal economies, and private domestic spaces. We draw on Tronto's care ethics [134], which guides us to what caring well may look like. We also use Puig de la Bellacasa's [34] matters of care, which teaches us about care as a networked practice, and asks: "What does caring mean when we go about thinking and living interdependently with beings other than human, in 'more than human' worlds?" (pp. 13) [34].

With these theoretical framings, and the context of Latino house-cleaners in Toronto, we ask the following research questions:

- **Q1:** How are Latino house-cleaners in Toronto engaging in networks of care through digital labor markets?
- **Q2:** How can the care practices of Latino house-cleaners inform future designs for digital care economies?

Our interviews with house-cleaners informed what challenges and harms exist in the current housecleaning economy, and how they leverage digital communities to address some of those harms. We saw that a complex network of care was at play between human and non-human entities entangled in moral and affective relations. To exemplify how care uniquely showed up in the context of our study, we build on existing theories of networked care and introduce the concept of 'lateral care'. Lateral care diverges from more traditional conceptualizations of care as it is focused around decentralized non-hierarchical networked systems of care, and - in the context of this study - enacted in digital spaces. These systems are characterized by shared identities and are bottom-up structures aimed at empowering their participants as they navigate differential power hierarchies. In the context of this paper, 'lateral care' manifests as care that is enacted *between* house-cleaners, rather than the care exchanges between cleaners and clients.

Beyond lateral care, the networks of care in the housecleaning space also incorporate people, technologies, spaces, and sociopolitical forces. We thus define "networks of care" as the full array of interactions between human and non-human actors which mutually influence and enact care. Within networks of care, actors have the responsibilities of both care giver and receiver as care exchanges are multidirectional and affect all network actors. Employing Tronto's ethics of care [134] along with Bellacasa's matters of care [35], our findings show the care practices of different actors within the networks of care, and highlight the importance of lateral care networks in scaffolding the client-worker exchanges of paid care work. Thus, lateral care in digital spaces was a vital component of these broader networks of care. We take inspiration from the care practices of digital communities to inform the future of digital labor platforms, and conclude with design suggestions, extending work from feminist HCI on caring frameworks for design.

2 RELATED WORK

2.1 Defining Care

Tronto and Fisher [135] define care as "a species of activity that includes everything we do to maintain, contain, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment". This broad definition underscores the ubiquity of care, and allows us to use it as a frame to shape the choices which build the world. What receives care and attention gets to be maintained, contained, and repaired. Importantly, this identifies care as both a practice and a politic, an affect and an action.

Tronto and Fisher [135] emphasize that the dimensions of care, including work, ethics, and affections, are not necessarily distributed equally in all relational situations; rather, they exist in a state of constant tension and contradiction. Through this framework, they build upon Gilligan's [51] understanding of two key aspects within morality of care: relationships viewed in terms of equitable treatment of individuals and how individuals are emotionally attached to one another. Each care relation then is complicated by the associated power imbalances that it may create and the emotions involved in each care exchange.

Looking at more complex systems of care, Puig de la Bellacasa [35] adopts an ecosystem perspective and expands care beyond interpersonal networks. This view integrates human actors, animals, technology and the environment/space itself into a network of care exchanges. She emphasizes the materiality of care, highlighting the embodied and situated nature of caring practices. She explores how care is enacted through material engagements, gestures, and technologies, challenging abstract and idealized notions of care. In theorizing care as a networked practice, Puig de la Bellacasa takes inspiration from Actor Network Theory, which brings humans and non-human objects in relation and mutual mediation [77] (in [36] pp.34). She then goes further to explore the impact of care as a force in networks. She conceptualizes the process of things coming to be as *matters of care*. Matters of care challenge the notion that things exist as a given, rather they are maintained by the practice of care [36](pp. 66). Therefore objects, technologies, people, and politics all interact, and studying or designing technology for these networks makes one a part of them.

2.2 Stages and Elements of Care

As a practice, Tronto [134] identifies four stages of care. Previous work from Helms et. al [60] engages these stages to trouble domestic design relations. These stages may occur in sequence or independently. Importantly, there are better and worse ways to enact each stage, and care in any stage is not inherently good. The stages are summarized below:

(1) **Caring about:** Recognizing the need for care. This may or may not lead to action beyond recognizing a need exists. Importantly, caring about can happen on an individual level and/or a societal level, which dictates what causes receive support and attention.
(2) **Taking care of:** Recognizing that actions can be taken to provide care for those who may need it. Taking care of is largely logistical and resource based.

(3) **Care giving:** Performing the direct fulfillment of needs. This is the stage of care most readily recognized as care.
(4) **Care receiving:** Responding to care received. This acknowledges that needs have been met, and provides feedback (appreciation, correction, etc.) to the person providing care.

In each of these stages, Tronto further narrows the definition by identifying elements of care, which Meng et al. [89] use these stages to analyze a civic data project, that must be present for care to be effected:

(1) **Attentiveness:** Being aware that a need is present.
(2) **Responsibility:** Being ready and willing to respond to a need.
(3) **Competence:** Having the skill to effectively care.
(4) **Responsiveness:** Being aware of potential vulnerabilities and abuses that might emerge from care.

This final element of care is of particular importance as care is unequally distributed and saturated with power relations. The burden of care is distributed disproportionately among intersectional identities of gender, class, race and citizenship [52]. When the exchange of care labor is done in a professional setting, such as housecleaning, the care receiver financially compensates the caregiver. However, this requires the caregiver to then perform additional labor to transform monetary resources to fulfill the needs of care. Despite the privileges and powers associated with those who are able to pay for another person to perform household labor, the person being cared for always experiences a level of vulnerability and reliance.

Tronto thus moves away from dyadic relations of care between a caregiver and a care receiver, and instead stresses the inherent interdependencies and the wider structural power relations that shape care. In conjunction with Puig de la Bellacasa [36], this brings to our attention the relations of sites and objects that are otherwise ignored, such as care relations between marginalized workers, and digital spaces in which they occur. This situated nature of care aligns with critical and feminist theories in HCI that underscore the complex networks of relations that shape sociotechnical systems [13, 126]. It particularly emphasizes how caring can be viewed as "a species activity that includes everything we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible" [135].

2.3 Gendered and Racialized Care

Care labor is largely performed by women, and often outsourced to women from marginalized communities (for ex. migrant women of color in Canada and the United States) [10, 45, 86, 120]. For this paper we focus on the context of North America, and therefore the majority of references will be specific to the Canadian and US American care economies. However, similar dynamics around care have been documented globally, with care being associated with women, lower valuation, and oppressive power dynamics [5, 18, 94]. Care has also traditionally been associated with ethics and morality, and particularly the ethics of women. Gilligan [51] proposed the 'ethic of care' to theorize women's morality, emphasizing the significance of relationships, empathy, and interdependence. Care ethics challenge the notion that justice and individual rights are the sole foundations of morality. Due to the associations of women with care and care with morality [52], women are perceived to have superior moral sensibilities [29], which implies a naturalness to women performing care labor, and a reason why they should be expected to do so [143].

Glenn [52] discusses the role of the global neoliberal market in care labor, highlighting how migrant women offer care work for lower compensation rates than their non-migrant counterparts [52]. In this context, Gago [50] argues that domestic work performed by migrants has been inscribed in labor market hierarchies and sexual divisions through the productivity of wages within capitalism, thereby simultaneously subordinating their roles and devaluing their work politically. The artificial divide between public and private spheres in Euro-American contexts, where the public sphere historically included spaces of politics and commerce and was associated with men, contrasts with the private sphere, which encompassed the family and home activities and was associated with women [134]. Hiring care workers for domestic work challenges this divide by bringing commerce from the public sphere into the private sphere, and vice versa. However, the historical placement of care within the private sphere has kept paid care work invisible and under-regulated, as it is still perceived as outside the public sphere.

Hired care workers are often invisibilized as they support care labor traditionally expected of women of the household [84]. Tronto's [134] stages of care illustrate the distinction between the person hiring (taking care of) and the worker (care giving). Hired workers are often delegated to do menial, repetitive housework such as cleaning, which is undervalued and often goes unnoticed [107], while spiritual work such as the moral upbringing of children, or determining the aesthetics of the home is highly valued. The latter is typically the domain of women of privilege, whereas the former is delegated to hired workers, often women of color (ibid). This division is within feminized transnational spaces, where there are unequal and asymmetric relations, as well as alliances, to supply both affective and material needs [50]. The invisibility of menial care work is compounded for migrants, who may not be recognized in formal labor markets due to inadequate documentation such as working visas, and professional certifications [101].

Migrants often turn to informal spaces for employment as they face challenges in the formal economy due to "language barriers, treatment of migrants as second-class citizens, and permanent transience [which] lead to isolation" [117]. This adds another layer of invisibility, which is a consequence of migrants engaging in unregulated, low-wage employment leading to various forms of exploitation and precarity [90]. In the absence of formally recognized support systems, migrants are compelled to lean on existing social relationships or establish informal networks to support them as they navigate the labor markets [4]. This compounded invisibility between migration status and the nature of care makes care work attractive to migrant populations who may not have the documentation to work in formalized employment and/or openly in public spaces.

2.4 Care and HCI

In the field of HCI, studies on care work have looked at both monetized and non-monetized care, exemplifying the wide array of

activities that can be considered care. This includes studying monetized care within the health industry [65, 68, 91, 115] and hired care givers [79, 139]. Others have looked at community support and maintenance work [81, 116], and envisioning positive futures [75]. Our study explores care exchanges in identity-based spaces through an intersectional feminist lens. It looks at the intersections of identities, labor, digital and physical spaces, and paid care work and unpaid exchanges of care. In particular, the focal point is on the care articulated in the digital spaces utilized by house-cleaners and how it informs cleaners' experiences within paid care work, along with exemplifying the sociopolitical context of housecleaning in Toronto.

Digital spaces are increasingly hosting communities of care based on shared identities or experiences [9, 23, 49, 92], where participants can request specific types of support and find solidarity with others facing similar issues. These systems of care are even more important when formal support systems inadequately serve members of marginalized communities. For example, when systems such as governmental aid that are difficult or broken, collectives help fill gaps of care [41, 67]. Importantly, prior work has identified the networked nature of care work, including the technologies at play in care exchanges. Meng et al. [89] show how technologies in a "caring democracy" act in relation to the communities they are used by, and are themselves shaped by caring networks. Dye et al. [42] show how a community can care for a technolgoical network, sustaining the community and the technology itself. The effect of technologies as agents in care networks is not always positive, however, and the introduction of technologies run the risk of interfering with appropriate care work [65, 110].

Other studies have identified the need to better support caregivers, and to explore technology's potential role for positive intervention [28, 82, 95, 128]. For example, technologies can help visibilize and document the often-invisible labor of care in the domestic space [15]. Importantly, studies that have looked into caregivers supporting each other [65, 95, 99] have shown that they can offer a way for caregivers to connect and organize among themselves.

Feminist HCI has particularly engaged with care as a theoretical lens for HCI research and design [12, 60, 69, 121]. Croon et al. [32] discuss how HCI design-oriented research can think with care to incorporate feminist theories such as diffractive thinking and situated knowledge. Toombs et al. [130] discuss the networks of care that emerge from long-term qualitative HCI research projects. Furthermore, feminist HCI scholars have also called for the HCI discipline as a whole to engage with and incorporate care in design when interacting with research subjects and formulating knowledge [63, 70, 129, 132].

This paper responds to this call by applying theories of care ethics to house-cleaners' networks of care. We contribute to the existing scholarship of care by exploring networks of care at the intersection of identity, care work labor markets, and mutual support networks. Using this framing we contribute to feminist HCI by proposing design approaches that align both with the needs of our participants and with elements of care that are situated within a complex web of relations.

3 METHODS

3.1 Participants and Recruitment

For our study, which was approved through our university research ethics board, we conducted 19 semi-structured interviews with Latino immigrant house-cleaners in Toronto, Canada. Interviews took place online and in-person, lasted between 90-120 minutes, and were recorded with the consent of the participants. Participants received $35[2] as compensation. We recruited participants through three channels: Facebook posts in groups for Latin American immigrants, a local community center where one researcher (R2) worked, and snowball sampling. We aimed to include a diversity of participants based on age, nationality, immigration status, educational background, and gender.

As shown in Table 1, most participants identified as women (17/19), and hold a college or university degree (16/19). None of the participants worked in housecleaning prior to arriving in Toronto. All house-cleaners identified as Latino with eight Mexicans, five Chileans, two Venezuelans, two Peruvians, one Colombian, and one Ecuadorian. Most were between the ages of 30 and 50 (13/19). Half of participants lived in Canada for five or less years, and the other half for six or more. Regarding housecleaning experiences, participants worked in various spaces including private homes, and commercial buildings. 12 participants found employment as independent contractors, five worked through cleaning agencies, and two used a blend of both.

3.2 Data Collection and Analysis

Two researchers, both of whom spoke Spanish as their native language, conducted the interviews. The first researcher (R1), is a Colombian woman living in Colombia. The second interviewer (R2), is Venezuelan, and lives in Toronto where they have prior experience working as a house-cleaner. R1 conducted 13 interviews, and R2 conducted 6. Interviews focused on four subjects: demographics and personal history; housecleaning practices; communication practices within the Latino community; and the role of technology in their personal and professional lives.

R1 and R2 transcribed audio-recorded interviews in Spanish, and then worked together to translate them into English[3]. Following translation, we relied on an iterative inductive analysis approach through which we used thematic analysis to develop our codes into high-level themes [31, 112]. All paper authors first met to build an initial codebook based on preliminary debrief conversations and field notes from the interviews. Next, two researchers with different positionalities, R1 and R3 (R3 being a white, Canadian-American) iteratively coded the transcripts based on this codebook. Researchers' divergent perspectives led to differences in coding based on their lived experiences. R4 (a white Canadian who speaks Spanish and is experienced in this paper's inductive analysis process) helped R1 and R3 assess intercoder agreement at each coding iteration, and also led discussions to facilitate consensus between coders.

[2]Canadian dollars

[3]We translated transcripts into English for analysis for two reasons: owing to resource and availability limitations, R2 was not able to participate in the coding process, and we felt that our analysis process would benefit from a diversity of researcher perspectives, including those of non-Spanish speakers.

Table 1: Overview of Interview Participants

P	Age	Nationality	Gender (M/W)	Years in Canada	Education Level
P1	50-59	Venezuela	W	6-10	University
P2	50-59	Mexico	W	11+	University
P3	30-39	Mexico	W	0-1	University
P4	30-39	Chile	W	6-10	University
P5	30-39	Mexico	W	11+	University
P6	40-49	Peru	W	2-3	N/A
P7	20-29	Mexico	W	0-1	N/A
P8	40-49	Mexico	W	0-1	University
P9	20-29	Peru	W	11+	High School
P10	40-49	Venezuela	W	6-10	University
P11	20-29	Ecuador	W	11+	University
P12	40-49	Mexico	W	0-1	University
P13	30-39	Chile	W	0-1	University
P14	40-49	Colombia	W	4-5	University
P15	30-39	Chile	W	4-5	University
P16	60-69	Mexico	M	6-10	University
P17	30-39	Chile	W	6-10	University
P18	30-39	Chile	M	4-5	University
P19	30-39	Mexico	W	6-10	University

After finalizing the codebook, R1 and R3 coded all 19 interviews, and R4 arbitrated any differences between the coding, creating a final coded dataset. The final Cohen's Kappa was 0.64, indicating strong intercoder reliability [88]. We relied on Cohen's Kappa's intercoder reliability assessments as they are useful and appropriate to develop and refine the codes, identify points of disagreement, and ensure consistency between coders [87]. Furthermore, intercoder reliability assessments allow researchers to evaluate the rigor and clarity of their codes, corresponding definitions, and their applicability to the data [85]. We leveraged this analysis method not to reach a singular positivist interpretation, but rather to achieve a consensual framework for understanding the codes and interpreting the data [96].

After completing this intercoder reliability process, we leveraged thematic analysis to generate and define themes [31, 112]. To create themes, our research team discussed Tronto's elements and stages of care [134], and Puig de la Bellacasa's matters of care [34] as sensitizing topics. Next R1, R3 and R4 independently analyzed the coded sections from the codebook, and then discussed emerging ideas. We generated several theme ideas, which we eventually refined down to five central themes: morality of care, affective relations, valuations of expertise, care roles of clients, and lateral care.

4 FINDINGS

Our findings reaffirm the complex socio-political dimensions of care deeply intertwined with gendered dynamics. In addition to confirming gendered dynamics of care, we explore how participants' experiences performing care work relate to existing theories of care, mediated by gendered dynamics of affect and morality. We examine the relational network that emerges from the participants' care work, including clients, other humans, and more-than-humans. Participants associated moral values with their work, and expressed feelings of satisfaction from their occupation. They also became affectively intertwined with the network of human and non-human actors which received care from their labor. We show the ways that these various actors are connected by exemplifying the moral, emotional and socio-political ways they are interconnected.

The relation between cleaning and gender was made evident in our participants' demographics, with the majority being Latina women (17/19). Our findings echo existing works that show care work is largely performed by women, and that care duties are not restricted to just professional lives [46]. While participants performed client care work through housecleaning, they also managed care labor within their own households such as *"[making] the food, [buying] all the groceries, [doing] the laundry…[taking] care of all the cleaning in my house"* (P11). At times, their personal and work-related care giving responsibilities would be in conflict, such as balancing childcare alongside work shifts, or declining work opportunities due to their personal care giving responsibilities. P6 even noted that she continued to perform the care labor at home despite having a chronic pain condition. This highlights expectations for women to perform care labor in domestic environments, often without receiving care themselves. While our participants' women clients are not exempt from care labor, they have the privilege of outsourcing this labor onto others [52], such as our participants. This was evident in our interviews, for example, one client hired a cleaning service before her boyfriend returned home from a trip to make it seem that she had cleaned for him (P1).

The networks of care for Latino house-cleaners in Toronto went well beyond the exchange of care between cleaner and client - they included their families, the families clients, and other cleaners. Further, non-human actors such as the house being cleaned and digital platforms were part of these networks. Participants used social media platforms, such as Facebook, and classified sites such as Craigslist, Kijiji[4], and Comprayventa[5] to source work. Importantly, participants were part of networks of lateral care, which emerged organically in Facebook groups and afforded care *between* cleaners. These digital spaces were essential for our participants performing housecleaning, as they used them to find work, exchange cleaning tips, and protect themselves against exploitative clients.

Participants noted that compensation for their care labor was at times insufficient, and some clients did not respond to care or acknowledge power dynamics in an appropriate manner. Like in other care work [19, 56], we found that house-cleaners were undervalued and under-compensated, an issue exacerbated by lack of formal infrastructures of support [67]. However, our participants had mechanisms to bridge the care deficit created by poor care receiving, primarily by fostering interdependent relationships with fellow house-cleaners, facilitated through digital platforms.

4.1 Morality of Care

Echoing the interrelation of care and women's contribution to society, participants connected their work as cleaners to a contribution

[4]Kijiji is a Canadian classified ads website
[5]Comprayventa is an online and physical classified and marketplace site for Hispanic communities living in Canada

to humanity as a whole. P1 emphasized the value she felt she creates with her work, remarking: *"I did something for humanity, for the health of Toronto … I didn't lie there staring up at the ceiling forever, that kind of thing, I was useful to society"*. The intrinsic moral value of doing care work was echoed by P12 in explaining the value beyond the economic compensation she gets from cleaning: *"No, it is not only [about economics], but because they are good people and I like to help them, I like it. I don't limit myself."* P11 went further, mentioning the intrinsic value of care as a passion for the work itself. Despite a lack of access to proper cleaning supplies and a lack of autonomy over her working conditions, she remains passionate about the job: *"There was no control, there was no control. You had to have a love for the art... to accept the job."* P1 also noted that cleaning gave her happiness, and that satisfaction would carry her through moments of frustration and anger: *"cleaning relaxes me a lot, because also is in this sense that someone watch/sees something is very dirty and suddenly you feel a rare satisfaction."* Our participants noted that they were paid at or below minimum wage, and that they often faced difficulties to receive this compensation (P7, P9, P14, P19), yet they remained in the housecleaning profession, and drew value from their work in non-financial ways.

In regards to housecleaning, tensions of care as an economic activity versus care as a moral imperative are of particular salience. Amid a strict public versus private divide, the provision for care is relegated to the private realm of family space while economic activity occurs publicly. While this division is inherently permeable, it is notably porous in the case of house-cleaners: their role blurs the market/home boundary as they perform care work in private spaces but find this work through public spaces. While our participants worked in clients' private homes, they found work through social platforms such as Facebook, and online classifieds such as Kijiji and Craigslist. Within the public sphere, neoliberal economies value financial over moral values, and center the individual over community [141]. Despite the transitive conclusion that because the work is sourced in the public market, this work would not be particularly concerned with moral issues, we find that the moral values of care work are more prominent than the fiscal and individualist priorities of the market. We will see this more in the ways our participants leveraged digital spaces to form communities of lateral care.

There was also a sense that being a cleaner just for financial gain could lead to sub-par work, as *"there are people who go there just to earn money and that's it. And suddenly they have the need, but they don't like to do the job well"* (P15). As noted by participants, the value and satisfaction gained from performing care work is tied to its positive moral valence. This emphasis on the satisfaction and morality of housecleaning echo the sociopolitical understanding of care as bringing intrinsic value to the care worker[52].

Further, while our participants expressed pride and a dedication to care well for the spaces they were tasked with cleaning, they were also concerned with negative perceptions of the profession. This reflects the paradox of care in which care work has an intrinsic positive moral valence, but is devalued socially. Tronto [134] notes that in highly individualistic societies (such as Canada), care is delegated to individuals from a lower social strata to shield care receivers from the vulnerability associated with acknowledging their need for care. The social devaluation of care thus serves to safeguard care receivers and their image of independence. P15 did not want to tell her parents that she was working as a cleaner, worrying that it would *"break their egos"*, while P8 discussed having difficulty talking to her friends about her job without shame. Most participants worked professions other than cleaning in their country of origin (17/19) and held university degrees (16/19), and were cleaners out of necessity rather than by choice. For example, P19 expressed clearly that he did not want to be "*stuck in this thing [housecleaning] forever*", but he is doing this because of life circumstances, and P5 specified that *"it wasn't something [she] thought [she] was going to do all [her] life*." At the same time, participants noted that they themselves did not look down upon cleaners who had made housecleaning their life's profession. Rather, they were concerned with the way the profession was perceived by others.

In addition to the moral forces that existed between actors in the network of care, participants expressed emotional relations between themselves and the members of the network of care. We particularly see this in how cleaners became affectively intertwined with the private ecosystem they work in, including the physical spaces, children, pets, and clients.

4.2 Affective Relations

Affective, or emotional, relations manifested in numerous human and non-human attachments in our participants' work. These exchanges exemplified the networks of care similar to Puig de la Bellacasa's conceptualization, in which care relations are a practice motivated by emotions [36]. Interviewees mentioned they developed attachments beyond the service exchange with clients, and other human and non-human entities in the network of care. For example, P12 described how she formed a close relationship with one employer which was not limited to work-related duties. She notes:

> "When you no longer talk only about what you clean in the house and talk to other topics and begin a more sentimental connection, they want to know how you are [...]. With this particular client, I feel there is a very rich connection [...] beyond work. And the fact that I ask you how your children are and how you are, there is something more" (P12).

Care work for this client went beyond a tangible economic responsibility to an emotional responsibility. This mirrors Lopez's [83] (in [36]) theories of care responsibilities, which encompass both tangible and emotional responsibilities connected to communication, fostering social interactions, and sustaining lives. In these complex practices, it is not easy to quantify or confine these responsibilities to rigid tasks with distinct starting and ending points [34].

Not all affective attachments were entirely positive, however; it was particularly difficult when clients with whom participants had formed affective relations with did not *receive* care well. P12 shares her experience:

> "I was working with a lady who lives alone and I was with her for eight years, [...] She paid me $120 every three weeks, and I did everything for her because the lady always talks to me, she asks me about my family. We became very close friends. Then, after eight years

> I was working with her and I asked her if she would raise me $10. [...] Then she got angry and told me that no, she couldn't raise my salary. She called me and said: "How are you? And she told me, how is everything, and then she said thank you very much, but I don't need your services anymore" (P12).

These affective attachments, characterized by a dispersion of interests and other interconnected forces, align with Bellacasa's characterization of care agencies as "decentered and distributed in fields of meaning-making materialities" [36]. Echoing Puig de la Bellacasa's framework, these relationships extend beyond a conventional understanding of care as a transactional endeavor. Instead, these relations manifest as intricate networks of shared emotions, histories, and mutual support, deeply intertwined with the fabric of everyday life.

4.2.1 Attachment to Physical Space. Moving beyond interpersonal care giving relations, participants expressed affective attachment to their non-human recipients of care. They expressed a pride in doing the care giving job well, even giving more of their time and energy than the job asked to ensure their work was completed to a high quality. Some participants remarked on feeling a need to strive to a point of 'perfection' (P13), noting the pride they took in caring for the physical space. For example, P14 enjoys cleaning the restroom for this reason: *"because I'm picky, I like the restroom to be very perfect. And the toilet is the most noticeable place where you can tell if you have cleaned well and that there is no hair left, for example"* (P14). The value participants placed in properly caring for a space was also reflected in their frustrations with the way others treat the spaces entrusted to their care. In response to witnessing the neglectful treatment of the living spaces she was tasked with cleaning, P13 remarked: *"that is a lack of education and respect for the place where you live"*. In the case of housecleaning, the physical space itself and those who occupy it are care recipients. The space engages in the network of care with the other agents: the client, the physical space, and its occupants.

Participants can be said to be *attentive* to the needs of the space they are cleaning, several mentioning that they have a particular attention to detail that identifies substandard levels of cleanliness, in contrast to the house-owners. P7 states this outright, saying *"many people don't... they don't take care of it [their homes]."* Others expressed distress when seeing particularly dirty homes when arriving at new clients' homes. The way *attentiveness* manifests in this example points to the role of the space as an agent itself with needs which care can fulfill. This further evidences the relational and ethical nature of care where the space itself and the objects in it serve as key actors in the care relations [34]. Being *attentive* to the needs of the space, and critiquing the clients' lack of *attentiveness* engages in a relational ethics that considers the entanglements and interdependencies between humans, non-human beings, and the environment.

Participants also noted that the house participated in the network of care through *care receiving*. They noted how seeing the house transform from dirty to clean brought them pleasure, from observing how much dust they were able to pick up in the vacuum (P11) to seeing a toilet go from dirty to spotless (P3). As participants were affectively tied to the spaces they worked in, and attended to the care receiving responses performed by the space, we see the significance of more-than-human exchanges of care.

4.3 Valuation of Expertise

Participants had to negotiate differences between their own *competence* in cleaning work with client expectations. Balancing caring for a space that belongs to another person, particularly someone with different perspectives on cleaning, and the specialized expertise our participants possessed required a performance of competence and respect.

In these household performances, participants demonstrate their competence through their knowledge of cleaning techniques, protective measures to preserve the space, and their maintenance of household spaces. For example, P2 describes her cleaning process and the specific supplies she uses to perform her tasks effectively: *"I consider the types of materials present in the bathroom. For instance, with granite or marble, you can't use just any liquid as it can cause damage. [...] I need to account for the types of flooring, the materials in the kitchen and bathrooms, and so on"* (P2). P2's account demonstrates how some cleaners aim to nurture these spaces based on their knowledge of materials and cleaning tools.

When employers cast doubt on their skills and knowledge of cleanliness, including the proper cleaning product usage, our participants expressed frustration. For instance, P1 describes an experience where one client would not believe her expertise on a specific cleaning treatment, and checked the Internet to confirm that she was correct: *"I told him that they sell a specific product to clean it and when it isn't [available], you clean it with oil and then with soap to not damage the stone, he answered me he was going to check the internet to see if what I was saying was true"*(P1). This results from a clash with their cleaning expertise from prior experience, and the clients' vision of cleanliness in their own homes. One client discussed the differences between people from different cultures, for example with clients from different countries *"there are many organic products and others which are excessively chemical"*(P1). Another discussed learning about Kosher[6] cleaning products (P5). Therefore, one aspect of cleaners' responsibilities is to appropriately engage with clients' cultural settings. Care work in domestic spaces requires workers to adjust their practices to individualized home settings, unlike work that occurs in broader public spheres. The environments that participants worked in could differ in a single day, based on the clients they served.

Further, clients expect participants to hold particular competences based on the cleaner's cultural and gender identities. P19 for instance, a male participant, describes how some clients expect that young and attractive women will conform to the stereotype of the nurturing female caregiver (P19). Similarly, P14 shares how Latina women are often expected to hold greater expertise in activities like cooking and cleaning: *"there is the stereotype that Latinos, women, come to clean up... And from my own experience I've seen it too. Many of my friends, my woman friends work as cleaners"*(P14). P5 mentioned that she had been asked in an interview if she came *"from a Latin American country...most of them ask you directly if you*

[6]Kosher, or *kashrut* is a set of laws in Judaism which pertains to the types of food and food preparations which are permissible [102].

are Mexican"(P5). The stereotype of Latinas being good at house-cleaning shows how clients expect that Latinas are *competent* at cleaning, based on their identity. However, as participants were in the private sphere of the clients homes, they also had to adjust their cleaning techniques to match the cultures of the clients whose homes they were cleaning.

4.4 Care Roles of Clients

Participants experienced variation in *care receiving*. Several participants pointed out that clients might perform gestures of care to the cleaners, offering water or tea (P7), providing breaks for the house-cleaners, or giving gifts (P1). Within the context of monetized care, where care giving is a paid service, financial remuneration is also a form of care receiving. Aligning with historical accounts of care work being underpaid [52], participants noted that they were paid minimum wage ($15/h in Toronto) or lower, and would at times struggle to receive payment from clients. P17 shared that other gig work was paid higher than care work: *"in construction [the worker] is paid $18 an hour and [a cleaner] is paid $15"*(P17). Because of the informal nature of cleaning work, participants were not only paid low wages, they also were not compensated through benefits or safety nets. As P18 shares, *"so of course, I pay the tax at the end, so it's not like I get, I don't know, benefits of retirement and all that, like when I'm an old woman"*(P18). The low compensation was therefore multiplied as a result of care labor being under-paid, and the lack of social supports for informal work.

4.4.1 Client Culture. Participants attributed variation in *care receiving* to cultural differences. P13 identified being kind as a *"Canadian idyosyncracy"* and P11 mentioning *"[Canadian clients are] very friendly, very respectful of your time, very respectful of your work, and very willing to help you with whatever"*(P18). One theory from participants of the cause was that Canadians are less likely to know how to clean or do *"this type of work. The Canadians don't do it. That's why he appreciates it so much"*(P4). Some participants preferred working for clients of a particular ethnicity, and noted they felt some ethnicities were more dismissive or rude (P13, P18).

4.4.2 Visibility and Surveillance. Beyond explicit appreciation of participants' work, clients showed their appreciation for participants by leaving the house un-monitored, or going to a separate part of the home. This demonstrated clients' confidence in participants' *competence*. As one of them mentioned *"they go away and leave me alone for a while, sometimes they don't even tell me they are leaving"* (P1).

In contrast, some participants discussed clients who did not show confidence in their *competence* by surveilling their work. Importantly, these interactions had gendered and racialized dynamics. P1 discussed how she *"had the worst experiences with men… they don't look like they've cleaned a lot in their life, so sometimes they tell you things like… 'you say no, not that, that's not how you clean, that's not how you do it'"*. Doubting that P1 had properly cleaned, one male client went *"from room to room"*, claiming *"'I didn't see you vacuuming'"*, while another client questioned her knowledge of cleaning products, and said that *"he was going to check the internet to see if what [she] was saying was true"*(P1). Racialized dynamics showed up in the form of stereotypes, P8 discussed how she was suspected of stealing, and was asked *"you speak Spanish?"*, implying she was a suspect as a result of her ethnicity. Other participants were also accused of theft, P1 was accused of stealing a cleaning product and P18 was accused of the theft of a laptop. These interactions fail to recognize the house-cleaners' *competence*, doubting their ability to clean effectively and presuming the cleaners to engage in unprofessional conduct.

While some participants expressed frustration over having their cleaning efforts ignored, others mentioned they preferred a level of invisibility saying *"that's what I was really looking for, not to feel anyone's eyes, to feel free"*(P13). The same participant, however, discussed feeling invisible in a negative way, when people passing her in the lobby would ignore her work and step in places she had just finished mopping. Several participants discussed being required to document their cleaning work through digital mediums (i.e., photos of the space after cleaning) (P17, P19). Others were monitored through the digital apps used to facilitate work arrangements, with the application tracking their physical location. Others discussed being surveilled through cameras, as P3 showed: *"it is also common to find cameras while they are not there. Usually, they put some cameras on you so they can see what you're doing"*. Our participants also discussed mixed feelings about clients observing their work in-person. P14 mentioned feeling *"very uncomfortable, because they were there watching all the time next to you and I'm cleaning, I'm not going to do anything else."* Several mentioned they were the most comfortable when clients would leave them alone in the house.

Examples of clients surveilling cleaners and accusing them of stealing exemplified poor *responsiveness* on the part of clients. The clients in these examples were not properly acknowledging the power dynamic between a client and the cleaner, by doubting their competence, surveilling their work, and exacerbating precarity through insufficient compensation.

4.5 Lateral Care

Our participants leveraged digital platforms to find work and to create systems of lateral care that attended to the gaps and power imbalances in their care relations with clients (e.g., denied payment, high surveillance). Lateral care networks engage peers through social media to perform stereo-typically hierarchical care actions on each other. Most of our participants used digital communities to access and practice lateral care with other house-cleaners. While all previously discussed elements of care exist in lateral care (morality, affect, etc.), our participants showed how they engaged in reciprocal and networked exchanges of care to address poor *care receiving* and *responsiveness* from their clients.

All of our participants used identity-based Facebook groups to find work. Lateral care networks formed in these spaces, where other cleaners would help them find employment and provide other supports. Some groups focused solely on the Latino identity, while others were more specific to certain countries. Participants sought out identity-based spaces specifically, as P8 discusses *"I just write in the search engine Mexicans in Toronto and you get Facebook and it scrolls through various types of Latino groups or I even look for Colombians, and Venezuelans in Toronto."* Interestingly, interviewees

were not part of any cleaner-specific Facebook groups, only groups based on ethnicity and country of origin.

4.5.1 Digital Sororities as Lateral Care. In addition to ethic identity based groups, there were also intersectional groups for women-only Latina spaces such as Mamás Latinas, "Sororidad Chilena" (Chilean Sorority) and more private WhatsApp groups. As noted, the majority of our participants were Latinas. Women are over represented in domestic work [26], and Latina women are particularly associated with house-cleaning labor, a phenomena affirmed by our participants' experience. Women face particular barriers, such as lower compensation and devaluation in all economies, which is then amplified by the devaluation of care work. Furthermore, care work has historically lacked legal protections [52], and combined with the informal nature of their work, our participants do not have protections against discrimination that may be present in the formal public market. However, they were able to leverage digital 'sororities' for solidarity building with shared-identity worker coalitions. For example, P14 discusses:

> "Here in Canada I discovered how wonderful it is: Latino groups in Toronto, Chileans in Toronto, Sororidad. There is a special group of Chilean women called "Sororidad chilena en Toronto" [...] So also the idea is to be supportive of your partner. They also give you information, they all tell you like no, don't go work in this place" (P14).

Perhaps because the first focus of these spaces was on shared identities and mutual support, the lateral care networks in our study stood in contrast to other informal work platforms, which have previously been noted to isolate workers and break down collectives, through their design and the individualistic nature of capitalist economy [16]. Instead, online communities created caring networks in which cleaners who are members fulfill each others' needs. Despite the fact that in these spaces house-cleaners were in competition with each other for the same jobs, they use these spaces to help each other build knowledge of the housecleaning profession, and gain a footing in the Toronto housecleaning market. For example, they share cleaning product tips, exchanging *"what products do we use, look I got a product that does such and such"*(P1). Finding work was also facilitated on these digital community spaces *"especially the Facebook group pages of Latinos in Toronto, there's always a lot of work. And networks as well. For example, if you post on Facebook, if a friend of yours knows about a job, I have a job. And this friend, in other words, they put you in contact with another person that you don't know but is your friend's friend, so it also works"*(P14). The pursuit of livelihood in an informal economy provided a common connector going beyond housecleaning, *"they help each other because they are looking for work, they offer work, or there are people who, because of the pandemic, are starting businesses or selling food, or they say I offer my work to repair something"*(P12). While clients at times failed to recognize the cleaners' competence, in these spaces they were well recognized by other cleaners offering them work from clients should they have a scheduling conflict or limited capacity to take the job.

The referral process also allowed our participants to avoid working for clients whose *care receiving* did not match with the participants' needs, or who exacerbated power imbalances by not attending to *recognition*. In this way, they relied on the information from the other house-cleaners to strengthen their care network, by selecting clients more likely to fit into their network.

Information sharing practices also aided in combating capitalistic tendencies to isolate workers. Cleaners discussed labor issues such as *"how much each one is earning, the hours"*(P1). One participant (P7) worked with another cleaner on the platform to report a client who had not paid her:

> "I knew his name, his phone number, and a photo and I burned him on Facebook. [...] This person doesn't pay and I told details and a stranger contacted me and said: 'He didn't pay me either, let's join together against him'. Then the guy contacted the guy and he told me, he said, he told me: 'Take it off, take it off, take it off. I already paid you, but take it off.' Then he said to me, 'put it down and I'll pay you. When the transfer comes, you take it down'. And so that was so. He paid me" (P7).

Not only did this participant ensure she received proper compensation for her own work, she also cared for the other cleaners in the group, making sure they did not work with this abusive client. Several of our participants mentioned preferring finding work on Facebook because of this added layer to check if a client would be safe to work with. On Facebook, exchanges of care were so effective in avoiding abusive clients that P1 posited its effect should a similar capability be available on Kijiji: *"if there was a Kijiji of domestic workers, more than one person in Toronto would be left without cleaning services."*

The power of lateral information sharing as care is evident, as it can prevent abusive clients from getting services. This shows the potential for lateral care to be leveraged in labor markets in future designs. Importantly, the lateral care exchanges that emerged from our data arose organically out of identity based networks. Furthermore, these networks were in unofficial spaces, and were not solely meant for the participants' professional identities. As participants found their employment, learned cleaning information, and were able to get supports to avoid exploitation from these lateral care networks, the client-cleaner care exchange would not have been possible without them. The digital spaces where the worker sororities emerged were also vital mediators in the networks of care, as evidenced by the difference between the affordances for lateral care on Facebook versus the classified sites.

5 DISCUSSION

Examining the ways that care manifests for Latino house-cleaners in Toronto reveals implications for the design of 'caring' technologies in digital care economies, particularly for care work existing within the private sphere and/or informal settings. Further, as new platforms for labor are designed, designers must design "with care" from the outset. Care extends beyond the dyadic relations between caregivers and care receivers; instead it is a complex network of people, technologies, environments, and socio-political forces. Consequently, designers of technologies facilitating arrangements of care work are inherently enmeshed in these networks. Existing literature on care ethics in HCI has stressed the importance of designers being aware of the sociopolitical contexts design is part

of and the complex entanglements that various stakeholders (including researchers and designers) are engaged in [14, 69, 70, 130]. Further, designers have to engage with the power relations that shape care ecosystems and the inherent relationality of care ethics [70].

Our research extends this work by highlighting how identity-based lateral care networks emerge in the face of power differentials to support particularly Latina house-cleaners. Such informal identity networks have historically been important in challenging injustice and facilitating collective action in neoliberal labor markets [38, 62, 111, 133]. The presence of these digital identity spaces offers valuable insights to designers as they envision the future of labor platforms (whether that be sites such as Care.com, or classifieds and social media platforms) and their own place in these networks of care. A particularly important consideration is how designers can either facilitate lateral care, leverage it, and at worst, avoid disrupting it.

Care, as an evolving practice, is shaped by the affective tension between the 'personal,' characterized as an individual's emotional engagement in attachments, and the 'collective,' characterized as a network of relationships among humans and non-humans embedded in the material practices of everyday life [34]. This framing underscores that care is situated and "embedded in the practices that maintain the webs of relationality that we form" [100].

Using theories of care that acknowledge both the personal and the collective, along with insights from our first research question (Q1: How are Latino house-cleaners in Toronto engaging in networks of care through digital labor markets?), we address our second research question (Q2: How can the lateral care practice by Latino house-cleaners inform future designs for digital care economies?). We propose the following guidelines for designers to engage in the future of informal care work while also prioritizing care themselves:

- Engage with the affective human and more-than-human networks of care already at play
- Attend to the balance between individual visibility and valuation of care work
- Consider care as a foundational concept in the future design of digital care economies

5.1 Attending to Networks of Care

Current digital labor marketplaces focus on matching supply and demand for specific tasks (e.g., care work). However, prior HCI research has highlighted the materiality and sociality of markets that go beyond economic transactions [25]. Further, feminist HCI research has also engaged with care from a more-than-human approach [70, 137] acknowledging the interconnectedness of human and non-human entities.

In the case of the housecleaning, we saw how care relations include non-human dimensions. The house, as an entity, actively participates in the care network, not just as a location but as a care recipient. The house also has needs which require maintenance. The condition of a house not only affects its functionality but also has an impact on the well-being of its occupant, i.e. the client. Thus, both the client and the house are recipients of care. The house's condition prescribes a specific modality of care, subsequently guiding the decisions and actions of the client and cleaner. A dirtier house requires a different level of care compared to a tidy one, but it also might be more receptive to care, given the stark contrast between its initial state and its appearance post-cleaning. Drawing from Puig de la Bellacasa [34] care in this context is shaped by the needs and conditions of all the entities involved in the care network. The house, in its response to care, acts as an agent; its appearance signifies successful care, providing positive feedback to the cleaner. Meanwhile the client also expresses *care receiving* through appreciation and financial remuneration.

There is thus an intricate network of moral and affective connections shaping cleaning work. Participants are involved in both care receiving and care giving with the client, the house, and the client's family, in addition to care duties for their own families and homes. Importantly, participants were part of informal, identity-based networks (or digital sororities) that were instrumental in enabling them to manage their care duties. Here they supported other Latino cleaners while also receiving support. These lateral care spaces were not just supplementary; they were integral to the functioning of the broader housecleaning care networks.

5.1.1 Importance of Lateral Care Networks. Previous HCI research has studied the formation and maintenance of networks of care to support care workers in a variety of spaces such as healthcare [78, 91, 95, 128], mental health [17, 122], and elder/child care [8, 47, 55]. Largely on unpaid (often hierarchical) care work, these studies focus on the intentional design of spaces and technologies that can help augment existing support systems. Building on this literature, we argue that there is much to learn from *how* and *why* these lateral care networks organically emerge as marginalized workers seek to find ways to support themselves in the absence of any formal support. Shared identity plays a crucial role in the creation and maintenance of these lateral networks. We see similar networks being created by other marginalized identities - for example, Wilcox et. al [140] discuss how trans and non-binary people exchange information and support each others' well-being through technology, and Musgrave et. al [92] explore how Black women and femmes use digital spaces to form networks of care against online harassment.

The gig economy presents an ideal of becoming an individual entrepreneur, which often hinders collective organizing. Prior scholarship on the design of labor platforms shows that workers in these spaces, despite attempts to foster collective action, think of themselves as individual earners[106]. While our participants did embrace the entrepreneurial ethic, they also sourced work and grew their capacity to perform housecleaning work through lateral networks consisting of other Latina cleaners. Prior work has highlighted the resilience-building capacity and the support provided by these networked social ties [24, 136], and emphasized the strength of existing community bonds and the potential role technologies can play in enhancing them. Future design for digital care economies should draw focus towards supporting these affective engagements and helping foster lateral care. This could be done through creating spaces where lateral care networks based on shared identities organically emerge or through ensuring that

design does not interrupt existing lateral care networks that already support marginalized workers.

5.2 In(dividual)visibility versus Valuation

Our work adds to existing research on the gendered nature of invisible work and how certain kinds of labor are overlooked. While movements like the Wages for Housework campaign [44] have sought to visibilize care labor performed in domestic spaces, and prominent care philosophers have recognized care labor as central to their call for transformation to make more just societies [59, 93], the complexities of (in)visibility are highlighted by the vulnerabilities associated with being seen. Prior activism such as Wages for Housework has focused on attempting to move care labor more in the realm of the market, advocating for all care labor to be recognized as economic labor and consequently receive financial compensation. Indeed, as care has moved from the private sphere into the public sphere, this marketization has already begun. Platforms dedicated to care work, which visibilize the exchange of care work for financial remuneration, are on the rise (i.e., Care.com, Sitter City).

However, the invisibility of housecleaning work can best be understood through the lens of Hatton's [58] overlapping sociological dimensions of invisible work: cultural, legal and spatial. housecleaning is rendered invisible because a) care work has historically been devalued (cultural), b) it is part of the informal economy (legal), and c) it occurs in private spaces (spatial). Visibilizing care work has to contend with all these dimensions to understand in what ways it will or won't benefit workers.

HCI has already begun to engage with communities that prefer to remain under the radar as visibility may put their work and livelihoods at risk [24, 109, 113], with scholarship [123, 125] raising concerns that visibility can lead to surveillance [114]. This is especially true of the informal economy, where workers are purposefully invisible to evade being monitored by the state. It is therefore important for designers to consider the consequences and dangers of visibility and to ask what is being made visible and for whom [24, 103, 105]? For informal entrepreneurs such as house-cleaners, the ability to find employment outside of existing systems of monitoring (i.e., the state tracking labor or employers surveilling private homes) and controlling their visibility is empowering [24]. Further, as the house-cleaners were networked, individual visibility was tied to the visibility of the group, and shaped group organizing power [66].

In our study, work around visibilizing problematic clients and potential exploitation is already being done informally by housecleaners through the network of lateral care. Thus, rather than fixating on the visibility of workers, it is worth designing systems that instead support this by spotlighting employers and clients. For example, Stella, a local Montreal non-profit that supports sex workers (whose labor is criminalized in Canada), has designed an online information system called the Bad Client and Aggressor List, which enables workers to report abusive clients anonymously and receive counseling. This list is circulated by Stella in a physical and online newsletter, helping to foster community communication, worker agency and validation as well as violence prevention [124]. This community list illustrates how visibility of clients over the visibility of individual workers is a more suitable design decision for these care workers. This echoes findings from Irani et. al [64], in which facilitating connections between workers who are usually rendered invisible allows for discussions of insufficient wages and bad clients. Importantly, both the Stella list and the Turkopticon were intentionally built to facilitate information sharing between marginalized workers. This attends to Tronto's *responsiveness* element of care, attending to power imbalances in care exchanges. Further, in the case of worker groups such as house-cleaners, there is potential for leveraging pre-existing networks of lateral care.

Turning to the care networks existing in the digital community space in our study, we note that our participants chose to focus their job search efforts in identity-focused digital spaces. These environments allowed them to challenge the dynamics of other labor platforms or labor agencies which over-expose workers and underexpose clients. Additionally, in the digital community, participants were afforded some level of comfort that others in the space shared their identity, which potentially made it feel more safe to be visible. Prior work on identity-specific communities has shown the importance of visibility and boundaries of the community [33, 37, 40, 92]. Drawing on the way visibility is managed by community specific spaces and within these lateral networks, future labor platforms can be designed that attend to the need to acknowledge care labor and respect the agency of vulnerable workers to control their own visibility.

5.2.1 Care Receiving and Valuation of Care Work. Participants discussed *care receiving* in response to their work not only from clients, but also from the physical spaces they cleaned. Further, they developed affective relations with a myriad of actors within the network of care, including the client, children, pets and the space itself. Care receiving was also influenced by cultural and socioeconomic factors, which shaped how our participants perceived their work to be acknowledged by clients. While there is a risk in making care labor more visible, designers could attend to the *recognition* of care occurring within private spheres and work towards designs which can improve care receiving and attending to power dynamics in networked configurations. Prior work in feminist HCI has explored possible designs to recognize household labor [15] in a way that is still contained within the private sphere. Incorporation of the cultural context and setting expectations of care receiving could also facilitate appreciation of care work that is culturally appropriate to the care worker. As we saw in the lateral care offered between house-cleaners, one important function that virtual communities served was reporting on clients' care receiving. Appropriate care receiving must recognize the cultural needs of the care-giver as well as care-receiver and practice appropriate recognition of power dynamics.

5.3 Designing "with Care"

As technologies continue to reshape the nature of work, designers and researchers have to be aware of the care they enact through their designs. Theories of care provide frameworks that can inform how designers create and maintain digital platforms or spaces that support networks of care. Particularly, they are a way to amplify support for workers, decrease exploitation, while also helping us be cognizant of not disrupting existing networks of lateral care. Using

theories of care and the embodied experiences of our participants, we offer an extension of existing feminist HCI literature on design which calls for actionable advocacy through design [13, 22, 32]. Care, as a practice and a praxis which touches the market space and more elusive private spheres, when combined with feminist design principles works as a powerful framework for the future of more just design for labor technologies.

Tronto [134] highlights that as members of caring networks, it is our responsibility to *recognize* and respond to needs for care. Designers are intrinsically tied to the technologies they create and therefore enmeshed in care networks. For designers to care well it is necessary for them to integrate all four elements of care outlined by Tronto [134]: *attentiveness, responsibility, competence, and responsiveness*. Extant feminist HCI theories offer frameworks and ideas for incorporating these elements of care into design, which have already been explored in other spaces, for example civic justice [89, 116], reproductive health [6, 7, 121], and maker's communities [131, 136]. Recent work in the HCI and design scholarship communities have echoed similar calls for designers to attend to the networked effects of care [39, 48, 81]. As new labor platforms emerge, attending to the dynamics of care from their inception can contribute to the creation of more caring labor economies.

While *competence* may seem like a self-explanatory requirement for good design, it goes beyond the imperative to make usable designs. It includes competence around designing for diverse needs and navigating complex sociopolitical systems. For instance, even designs with an intention to improve lives can cause harm without the proper expertise [71]. Prior work in care has shown that technologies, when not designed with all of the complexities of care scenarios in mind, can in fact hinder care exchanges through over-datafication and introducing menial work to the work of care professionals [65, 110, 127]. Without recognizing technology design as based in liberal and patriarchal roots, repetition of systemic harm is inevitable [108].

Designers must also be *attentive* to needs of others who are enmeshed in care networks. Bardzell [13] emphasizes "an awareness of design artifacts' effects in their broadest contexts and awareness of the widest range of stakeholders throughout design reasoning, decision-making, and evaluation". In designing future platforms or markets, designers should be *attentive* to the needs of all stakeholders and acknowledge their needs, particularly those who are most marginalized by existing designs. Tronto [134] raises a moral dilemma: can someone be faulted for not knowing a care need exists, for example, inadvertently facilitating an abusive client relationship or unintentionally disrupting an existing lateral care network? Tronto suggests that neglecting the needs of others is a "moral evil" (pp 127). This highlights the imperative for designers to continuously educate themselves of the needs of those affected by their designs and the potential impacts.

Responsibility requires a proactive stance towards addressing care needs. Aligning with feminist calls to action and engagement [14], *responsibility* constitutes a commitment to address care needs. For instance, in our research we saw that participants compared Facebook, where they could affect lateral care, to Kijiji, where the design of the platform was more oriented towards just economic exchanges, rather than community relations. Taking *responsibility* could look like instituting community elements into more market exchange based platforms, or creating platforms that consider the informational needs of care-givers such as minimum wage and ways to respond to negative *care receiving*. Taking *responsibility* may also look like inaction, to avoid disrupting existing supports. As discussed, without lateral care, the client-cleaner care exchange could not have occurred. As neoliberal capital economies prioritize exchanges of service between a worker and an employer and entrepreneurial individuality, their designed interactions with the care worker community may interrupt lateral care, which designers must also be responsible for.

Finally, *responsiveness* requires a sensitivity to power dynamics, vulnerability, and inequality in care exchanges. To be in need of care inherently means a certain level of vulnerability, challenging the neoliberal paradigm of individual self-sufficiency [134]. For example, in our study, cleaners needed care to be able to work in the cleaning industry in a sustained manner. The power dynamics at play in this network of care were intersectional: racial, immigration status, and gender identities, along with having to navigate both public and private spheres. Light [80] discusses the imperative to break down boundaries and engage with identity in technology to challenge existing power structures, which is precisely what our participants achieved in their lateral care spaces.

Our exploration of visibility also highlights how design can reinforce existing power structures. Visibilizing care by bringing it into the market has the potential to create additional harmful relationships. Mapping existing power relations and addressing possible power imbalances that design can perpetuate is vital for the creation of platforms centered around care. True *responsiveness* will necessitate a balance of *attentiveness, responsibility, and competence*.

Engaging with care also requires the designer to engage affectively with the care network they are enmeshed with through their design work. Design practices have a tendency to create a technological object for a community, and then subsequently disengage from community [11, 30, 71]. This practice echos Tronto's "taking care of" stage, in which care is outsourced to another through the provision of attention resources [134].

In contrast, designing with care requires an affective immersion and embodied commitment in the process of care [32]. Puig de la Bellacasa [36] highlights the power of care in determining which structures and relations get attention and reinforcement. Rather than creating technologies detached from existing community dynamics, designers can support the resilience of pre-existing community networks. In doing so, they will also foster a more embodied engagement with the communities they aim to serve. However, at the same time, designers must continuously question and challenge existing dynamics and power structures [97]. Care is thus not just about maintaining relations but transforming them. As Puig de la Bellacasa notes, caring for humans and more-than-humans "inevitably does and undoes relation [...] it is about engaging in a better account of the world" [36].

6 CONCLUSION

While care work has historically been confined to private households and small community spaces, this labor is increasingly transitioning to the public economy owing to the emergence of digital platforms that facilitate market transactions. These digital spaces,

designed for both economic and social interactions, complicate care relations. Guided by Tronto's 'care ethics' and Puig de la Bellecasa's 'matters of care', we analyze the care practices and networks of 19 Latino house-cleaners in Toronto and discuss how designers can better support care workers.

Through this study, we investigated participants' experiences performing care work and the relational network that emerged from their work, including clients, other house-cleaners, and more-than-humans entities. We found that participants imbued their work with moral values, leading to feelings of job satisfaction. They also had affective connections within their care work network, both with human and non-human entities. For instance, house-cleaners and clients often developed strong emotional bonds, and house-cleaners exhibited a keen attentiveness to physical spaces. However, a recurring theme we found was that house-cleaners were undervalued, an issue worsened by lack of formal infrastructures of support. To counteract the care deficit created by poor care receiving, participants fostered interdependent relationships with fellow house-cleaners, facilitated through digital communities of practice, a phenomenon we term "lateral care."

From our findings of how Latino house-cleaners perform care work in the complex ecosystem of public and private spaces and relationships with clients, other house-cleaners, and more-than-humans, we identified how Tronto's four dimensions of care: *attentiveness, responsibility, competence,* and *responsiveness* manifest. While HCI designers can draw insights from these dimensions, they should also recognize their own place as actors in the network of care, while also supporting house-cleaners through continuously questioning and challenging prevailing dynamics and power structures. Based on our findings and the theories of Puig de la Bellecasa and Tronto, we propose the following guidelines for designers to engage in the future of informal care work:

- attend to the balance between individual visibility and valuation of care work;
- engage with the affective human and more-than-human networks of care already at play; and
- move beyond taking care of with design, towards designing with care.

We envision these guidelines as tools for HCI designers, expanding on feminist HCI guidelines for designers, enabling them to reflect upon their own positionality, establishing an embodied presence and long-term immersion in communities of care, and recognizing that care is not just about maintaining relations, but also transforming them.

6.1 Care at CHI

For the HCI community, it is a vital time to consider care and networks of interrelation. In 2020, SIGCHI created the CARES committee with sought to "to raise awareness of and deter discriminatory, harassing, or other unethical behavior and incidents related to SIG activities and publications" [2]. However, tensions still exist. The decision to host CHI, the premier HCI conference, in Honolulu, HI, has been met with reservations. Many within the community have voiced concerns, urging respect for the wishes of Native Hawaiians and local residents to avoid tourism to the islands [61]. Further the call for papers for this year's CHI coincided with the devastating Maui fires, which at the time of writing has killed 115 people and destroyed swaths of land [57].

While studies on domestic work in Hawaii are limited, the state has shown a commitment to regulating the industry with initiatives like the Domestic Worker Bill of Rights [43]. Due to influxes of foreign workers, and a rapidly aging population in need of care work, Hawaii faces an array of socio-political complexities around care [20].

As we explore in this paper, care goes beyond human interactions, it encompasses our relationships with objects, technology, and ecosystems. While CHI's current care initiatives are focused on prioritizing the safety and well-being of its members - a vital endeavor not to be dismissed - it is equally crucial for the HCI community to introspect what systems it is maintaining, and to identify what relationships require repair and nurturing.

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REFERENCES

[1] n.d.. Care. https://www.care.com/en-ca/?rx=Online|CareUSSplash|General|General 2023-09-14.
[2] n.d.. SICHI CARES. https://sigchi.org/resources/sigchi-cares/ 2023-09-14.
[3] n.d.. SitterCity. https://www.sittercity.com/ 2023-09-14.
[4] Precarias a la Deriva. 2006. De la precarización de la existencia a la huelga de cuidados. *Estudios sobre género y economía. Madrid: Akal* (2006).
[5] Kwabena O Akurang-Parry. 2010. Transformations in the feminization of unfree domestic labor: a study of Abaawa or prepubescent female servitude in modern Ghana. *International Labor and Working-Class History* 78, 1 (2010), 28–47.
[6] Teresa Almeida, Madeline Balaam, and Rob Comber. 2020. Woman-centered design through humanity, activism, and inclusion. *ACM Transactions on Computer-Human Interaction (TOCHI)* 27, 4 (2020), 1–30.
[7] Teresa Almeida, Rob Comber, and Madeline Balaam. 2016. HCI and Intimate Care as an Agenda for Change in Women's Health. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) *(CHI '16)*. Association for Computing Machinery, New York, NY, USA, 2599–2611. https://doi.org/10.1145/2858036.2858187
[8] Tawfiq Ammari and Sarita Schoenebeck. 2015. Networked empowerment on Facebook groups for parents of children with special needs. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*. 2805–2814.
[9] Nazanin Andalibi, Oliver L Haimson, Munmun De Choudhury, and Andrea Forte. 2018. Social support, reciprocity, and anonymity in responses to sexual abuse disclosures on social media. *ACM Transactions on Computer-Human Interaction (TOCHI)* 25, 5 (2018), 1–35.
[10] Abigail Bess Bakan, Daiva Stasiulis, and Daiva K Stasiulis. 1997. *Not one of the family: Foreign domestic workers in Canada*. University of Toronto Press.
[11] Liam Bannon, Jeffrey Bardzell, and Susanne Bødker. 2018. Introduction: Reimagining participatory design—Emerging voices. , 8 pages.
[12] Jeffrey Bardzell, Shaowen Bardzell, and Ann Light. 2021. Wanting to live here: Design after anthropocentric functionalism. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–24.
[13] Shaowen Bardzell. 2010. Feminist HCI: taking stock and outlining an agenda for design. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 1301–1310.
[14] Shaowen Bardzell and Jeffrey Bardzell. 2011. Towards a feminist HCI methodology: social science, feminism, and HCI. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 675–684.
[15] Shaowen Bardzell, Shad Gross, Jeffrey Wain, Austin Toombs, and Jeffrey Bardzell. 2011. The significant screwdriver: care, domestic masculinity, and interaction design. In *Proceedings of HCI 2011 The 25th BCS Conference on Human Computer Interaction 25*. 371–377.
[16] Tom Barratt, Caleb Goods, and Alex Veen. 2020. 'I'm my own boss…': Active intermediation and 'entrepreneurial'worker agency in the Australian gig-economy.

Environment and Planning A: Economy and Space 52, 8 (2020), 1643–1661.
[17] Nataly Birbeck, Shaun Lawson, Kellie Morrissey, Tim Rapley, and Patrick Olivier. 2017. Self Harmony: rethinking hackathons to design and critique digital technologies for those affected by self-harm. In *proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 146–157.
[18] Merike Blofield. 2009. Feudal enclaves and political reforms: Domestic workers in Latin America. *Latin American Research Review* 44, 1 (2009), 158–190.
[19] Deanne Bonnar. 2006. The wages of care: Change and resistance in support of caregiving work. *New Politics* 11, 1 (2006), 38.
[20] Kathryn L Braun, Denise C Nelson-Hurwitz, Mari Ono, Meripa Godinet, Margaret A Perkinson, Noreen Mokuau, and Donald Hayes. 2017. Insights in public health: From Hale to Kauhale: Public health, social work, and aging. *Hawai'i Journal of Medicine & Public Health* 76, 5 (2017), 135.
[21] Felix Carros, Isabel Schwaninger, Adrian Preussner, Dave Randall, Rainer Wieching, Geraldine Fitzpatrick, and Volker Wulf. 2022. Care workers making use of robots: Results of a three-month study on human-robot interaction within a care home. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–15.
[22] Anita Say Chan and Mayar El Bakry. 2020. Feminist design and the relational infrastructures of protest: perspectives, thoughts, and discussions on a global uprising. *Interactions* 27, 6 (2020), 30–35.
[23] Stevie Chancellor, Tanushree Mitra, and Munmun De Choudhury. 2016. Recovery amid pro-anorexia: Analysis of recovery in social media. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 2111–2123.
[24] Priyank Chandra. 2017. Informality and invisibility: Traditional technologies as tools for collaboration in an informal market. In *Proceedings of the 2017 chi conference on human factors in computing systems*. 4765–4775.
[25] Priyank Chandra, Syed Ishtiaque Ahmed, and Joyojeet Pal. 2017. Market practices and the bazaar: Technology consumption in ICT markets in the global south. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 4741–4752.
[26] Elaine L Chao and Kathleen P Utgoff. 2005. Women in the labor force: A databook. *US Department of Labor and US Bureau of Labor Statistics,(Sep 2006), BLS Report* 996 (2005).
[27] Anita Chen, Chien-Wen Yuan, Ning F. Ma, Chi-Yang Hsu, and Benjamin V. Hanrahan. 2019. Navigating Ride-Sharing Regulations: How Regulations Changed the 'Gig' of Ride-Sharing for Drivers in Taiwan. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland Uk) *(CHI '19)*. Association for Computing Machinery, New York, NY, USA, 1–12. https://doi.org/10.1145/3290605.3300366
[28] Yunan Chen, Victor Ngo, and Sun Young Park. 2013. Caring for caregivers: designing for integrality. In *Proceedings of the 2013 conference on Computer supported cooperative work*. 91–102.
[29] Nancy J Chodorow. 1999. *The reproduction of mothering: Psychoanalysis and the sociology of gender*. University of California Press.
[30] Sasha Costanza-Chock. 2020. *Design justice: Community-led practices to build the worlds we need*. The MIT Press.
[31] John W Creswell and J David Creswell. 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
[32] Anna Croon. 2022. Thinking with care in human–computer interaction. *Feminist Theory* 23, 2 (2022), 232–246.
[33] Dipto Das and Bryan Semaan. 2022. Collaborative identity decolonization as reclaiming narrative agency: Identity work of Bengali communities on Quora. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–23.
[34] Maria Puig de La Bellacasa. 2011. Matters of care in technoscience: Assembling neglected things. *Social studies of science* 41, 1 (2011), 85–106.
[35] Maria Puig De La Bellacasa. 2012. 'Nothing comes without its world': thinking with care. *The sociological review* 60, 2 (2012), 197–216.
[36] Maria Puig de La Bellacasa. 2017. *Matters of care: Speculative ethics in more than human worlds*. Vol. 41. U of Minnesota Press.
[37] Michael Ann DeVito, Ashley Marie Walker, and Julia R Fernandez. 2021. Values (mis) alignment: Exploring tensions between platform and LGBTQ+ community design values. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–27.
[38] Dipsita Dhar and Ashique Ali Thuppilikkat. 2022. Gendered labour's positions of vulnerabilities in digital labour platforms and strategies of resistance: a case study of women workers' struggle in Urban Company, New Delhi. *Gender & Development* 30, 3 (2022), 667–686.
[39] Lynn Dombrowski, Ellie Harmon, and Sarah Fox. 2016. Social justice-oriented interaction design: Outlining key design strategies and commitments. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems*. 656–671.
[40] Bryan Dosono and Bryan Semaan. 2020. Decolonizing tactics as collective resilience: Identity work of AAPI communities on Reddit. *Proceedings of the ACM on Human-Computer interaction* 4, CSCW1 (2020), 1–20.
[41] Michaelanne Dye. 2021. Un grano de arena: Infrastructural care, social media platforms, and the Venezuelan humanitarian crisis. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (2021), 1–28.
[42] Michaelanne Dye, David Nemer, Neha Kumar, and Amy S Bruckman. 2019. If it rains, ask grandma to disconnect the nano: Maintenance & care in Havana's streetnet. *Proceedings of the ACM on human-computer interaction* 3, CSCW (2019), 1–27.
[43] Kim England. 2017. Home, domestic work and the state: The spatial politics of domestic workers' activism. *Critical Social Policy* 37, 3 (2017), 367–385.
[44] Silvia Federici. 1975. *Wages against housework*. Falling Wall Press Bristol.
[45] Sujatha Fernandes. 2021. the domestic workers' strike: migrant women, social reproduction and contentious labour organising. *Feminist Review* 129, 1 (2021), 16–31.
[46] Janet Finch and Dulcie Groves. 2022. *A labour of love: Women, work and caring*. Taylor & Francis.
[47] Pin Sym Foong, Shengdong Zhao, Felicia Tan, and Joseph Jay Williams. 2018. Harvesting caregiving knowledge: Design considerations for integrating volunteer input in dementia care. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–12.
[48] Sarah Fox, Jill Dimond, Lilly Irani, Tad Hirsch, Michael Muller, and Shaowen Bardzell. 2017. Social Justice and Design: Power and oppression in collaborative systems. In *Companion of the 2017 acm conference on computer supported cooperative work and social computing*. 117–122.
[49] Manato Fujimoto, Haruka Wada, and Zhihua Zhang. 2019. A Proposal of Care Planning Infrastructure Platform for Reducing Burden on Caretakers in Nursing Homes. In *Workshop Proceedings of the 48th International Conference on Parallel Processing*. 1–4.
[50] María Verónica Gago. 2019. *La potencia feminista: o el deseo de cambiarlo todo*. Traficantes de sueños.
[51] Carol Gilligan. 1993. *In a different voice: Psychological theory and women's development*. Harvard university press.
[52] Evelyn Nakano Glenn. 2010. *Forced to care: Coercion and caregiving in America*. Harvard University Press.
[53] Peter Glick. 2021. Utilising digital services to empower the unpaid carers of individuals with long-term complex needs. *ACM SIGACCESS Accessibility and Computing* 129 (2021), 1–6.
[54] Mareike Glöss, Moira McGregor, and Barry Brown. 2016. Designing for labour: uber and the on-demand mobile workforce. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 1632–1643.
[55] Carol Heins Gonzales, Gondy Leroy, and Gianluca De Leo. 2009. Requirements engineering using appreciative inquiry for an online community of caregivers of children with autism. In *Proceedings of the 2009 ACM symposium on Applied Computing*. 142–146.
[56] Zara Haider. 2021. Migrant Nannies: Motivation, Treatment and Sacrifice. *Critical Reflections: A Student Journal on Contemporary Sociological Issues* (2021).
[57] Adeel Hassan. 2023. *Maui Wildfires: What We Know So Far*. https://www.nytimes.com/article/maui-wildfires-hawaii.html
[58] Erin Hatton. 2017. Mechanisms of invisibility: rethinking the concept of invisible work. *Work, employment and society* 31, 2 (2017), 336–351.
[59] Virginia Held. 2006. *The ethics of care: Personal, political, and global*. Oxford university press.
[60] Karey Helms and Ylva Fernaeus. 2021. Troubling Care: Four Orientations for Wickedness in Design. In *Designing Interactive Systems Conference 2021*. 789–801.
[61] Josiah Hester. 2023. *Why is CHI in Hawai'i*. Retrieved Sep 11, 2023 from https://www.chiinhawaii.info/
[62] Jane Holgate, Anna Pollert, Janroj Keles, and Leena Kumarappan. 2012. Union decline and voice among minority ethnic workers: do community-based social networks help to fill the gap? *Urban Studies* 49, 3 (2012), 613–630.
[63] Dorothy Howard and Lilly Irani. 2019. Ways of knowing when research subjects care. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–16.
[64] Lilly C Irani and M Six Silberman. 2013. Turkopticon: Interrupting worker invisibility in amazon mechanical turk. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 611–620.
[65] Azra Ismail, Deepika Yadav, Meghna Gupta, Kirti Dabas, Pushpendra Singh, and Neha Kumar. 2022. Imagining Caring Futures for Frontline Health Work. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–30.
[66] Sayash Kapoor, Matthew Sun, Mona Wang, Klaudia Jazwinska, and Elizabeth Anne Watkins. 2022. Weaving Privacy and Power: On the Privacy Practices of Labor Organizers in the US Technology Industry. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–33.
[67] Elizabeth Kaziunas, Michael S Klinkman, and Mark S Ackerman. 2019. Precarious interventions: Designing for ecologies of care. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–27.
[68] Elizabeth Kaziunas, Silvia Lindtner, Mark S Ackerman, and Joyce M Lee. 2018. Lived data: tinkering with bodies, code, and care work. *Human–Computer Interaction* 33, 1 (2018), 49–92.
[69] Cayla Key, Fiona Browne, Nick Taylor, and Jon Rogers. 2021. Proceed with care: Reimagining home iot through a care perspective. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–15.

[70] Cayla Key, Cally Gatehouse, and Nick Taylor. 2022. Feminist Care in the Anthropocene: Packing and Unpacking Tensions in Posthumanist HCI. In *Designing Interactive Systems Conference*. 677–692.

[71] Lucy Kimbell. 2011. Rethinking design thinking: Part I. *Design and culture* 3, 3 (2011), 285–306.

[72] Eliscia Kinder, Mohammad Hossein Jarrahi, and Will Sutherland. 2019. Gig platforms, tensions, alliances and ecosystems: An actor-network perspective. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–26.

[73] Simon Klakegg, Niels van Berkel, Aku Visuri, Hanna-Leena Huttunen, Simo Hosio, Chu Luo, Jorge Goncalves, and Denzil Ferreira. 2017. Designing a context-aware assistive infrastructure for elderly care. In *Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2017 ACM International Symposium on Wearable Computers*. 563–568.

[74] Farshad Kooti, Mihajlo Grbovic, Luca Maria Aiello, Nemanja Djuric, Vladan Radosavljevic, and Kristina Lerman. 2017. Analyzing Uber's Ride-Sharing Economy. In *Proceedings of the 26th International Conference on World Wide Web Companion* (Perth, Australia) *(WWW '17 Companion)*. International World Wide Web Conferences Steering Committee, Republic and Canton of Geneva, CHE, 574–582. https://doi.org/10.1145/3041021.3054194

[75] Neha Kumar. 2023. With HCI and Friends: Nurturing the Interstices of HCI. *Interactions* 30, 3 (2023), 70–71.

[76] Neha Kumar, Nassim Jafarinaimi, and Mehrab Bin Morshed. 2018. Uber in Bangladesh: The Tangled Web of Mobility and Justice. *Proc. ACM Hum.-Comput. Interact.* 2, CSCW, Article 98 (nov 2018), 21 pages. https://doi.org/10.1145/3274367

[77] Bruno Latour. 2007. *Reassembling the social: An introduction to actor-network-theory*. Oup Oxford.

[78] Zachary Levonian, Marco Dow, Drew Erikson, Sourojit Ghosh, Hannah Miller Hillberg, Saumik Narayanan, Loren Terveen, and Svetlana Yarosh. 2021. Patterns of patient and caregiver mutual support connections in an online health community. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (2021), 1–46.

[79] Lin Li, Vitica Arnold, and Anne Marie Piper. 2023. "Any bit of help, helps": Understanding how older caregivers use carework platforms for caregiving support. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–17.

[80] Ann Light. 2011. HCI as heterodoxy: Technologies of identity and the queering of interaction with computers. *Interacting with computers* 23, 5 (2011), 430–438.

[81] Ann Light and Yoko Akama. 2014. Structuring future social relations: the politics of care in participatory practice. In *Proceedings of the 13th Participatory Design Conference: Research Papers-Volume 1*. 151–160.

[82] Kiel Long, Lyndsey L Bakewell, Roisin C McNaney, Konstantina Vasileiou, Mark Atkinson, Manuela Barreto, Julie Barnett, Michael Wilson, Shaun Lawson, and John Vines. 2017. Connecting those that care: Designing for transitioning, talking, belonging and escaping. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 1339–1351.

[83] Silvia López Gil. 2007. *LAS LÓGICAS DEL CUIDADO*. https://www.diagonalperiodico.net/humor/logicas-del-cuidado.html

[84] Cameron Lynne Macdonald. 2011. *Shadow mothers: Nannies, au pairs, and the micropolitics of mothering*. Univ of California Press.

[85] Catherine MacPhail, Nomhle Khoza, Laurie Abler, and Meghna Ranganathan. 2016. Process guidelines for establishing intercoder reliability in qualitative studies. *Qualitative research* 16, 2 (2016), 198–212.

[86] STEPHEN MCCALL and KEZIA SCALES. 2022. Direct care worker disparities: Key trends and challenges. (2022).

[87] Nora McDonald, Sarita Schoenebeck, and Andrea Forte. 2019. Reliability and inter-rater reliability in qualitative research: Norms and guidelines for CSCW and HCI practice. *Proceedings of the ACM on human-computer interaction* 3, CSCW (2019), 1–23.

[88] Mary L McHugh. 2012. Interrater reliability: the kappa statistic. *Biochemia medica* 22, 3 (2012), 276–282.

[89] Amanda Meng, Carl DiSalvo, and Ellen Zegura. 2019. Collaborative data work towards a caring democracy. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–23.

[90] Alessandra Mezzadri. 2020. The informal labours of social reproduction. *Global Labour Journal* 11, 2 (2020), 156–163.

[91] Andrew D Miller, Sonali R Mishra, Logan Kendall, Shefali Haldar, Ari H Pollack, and Wanda Pratt. 2016. Partners in care: design considerations for caregivers and patients during a hospital stay. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 756–769.

[92] Tyler Musgrave, Alia Cummings, and Sarita Schoenebeck. 2022. Experiences of Harm, Healing, and Joy among Black Women and Femmes on Social Media. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–17.

[93] Ella Myers. 2013. *Worldly ethics: Democratic politics and care for the world*. Duke University Press.

[94] N Neetha and Rajni Palriwala. 2011. The absence of state law: Domestic workers in India. *Canadian Journal of Women and the Law* 23, 1 (2011), 97–120.

[95] Sarah Nikkhah, Swaroop John, Krishna Supradeep Yalamarti, Emily L. Mueller, and Andrew D. Miller. 2021. Helping Their Child, Helping Each Other: Parents' Mediated Social Support in the Children's Hospital. In *Companion Publication of the 2021 Conference on Computer Supported Cooperative Work and Social Computing*. 140–143.

[96] Cliodhna O'Connor and Helene Joffe. 2020. Intercoder reliability in qualitative research: debates and practical guidelines. *International journal of qualitative methods* 19 (2020), 1609406919899220.

[97] Adrian Petterson, Keith Cheng, and Priyank Chandra. 2023. Playing with Power Tools: Design Toolkits and the Framing of Equity. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–24.

[98] Ai-jen Poo and Carol Whitlatch. 2017. Caregiving in America: Supporting families, strengthening the workforce. *Generations* 40, 4 (2017), 87–93.

[99] Anthony Poon, Lourdes Guerrero, Julia Loughman, Matthew Luebke, Ann Lee, Madeline Sterling, and Nicola Dell. 2023. Designing for Peer-Led Critical Pedagogies in Computer-Mediated Support Groups for Home Care Workers. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–18.

[100] María Puig de La Bellacasa. 2010. Ethical doings in naturecultures. *Ethics, place and environment* 13, 2 (2010), 151–169.

[101] Verónica Caridad Rabelo and Ramaswami Mahalingam. 2019. "They really don't want to see us": How cleaners experience invisible 'dirty'work. *Journal of Vocational Behavior* 113 (2019), 103–114.

[102] Harry; Rela Mintz G. Rabinowicz. 2007. Dietary Laws. In *Encyclopaedia Judaica*. Macmillan Reference USA, 650–659.

[103] Noopur Raval. 2021. Interrupting invisibility in a global world. *interactions* 28, 4 (2021), 27–31.

[104] Noopur Raval and Paul Dourish. 2016. Standing out from the crowd: Emotional labor, body labor, and temporal labor in ridesharing. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 97–107.

[105] Noopur Raval and Joyojeet Pal. 2019. Making a" Pro":'professionalism'after platforms in beauty-work. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–17.

[106] Alexandrea J Ravenelle. 2017. Sharing economy workers: selling, not sharing. *Cambridge Journal of Regions, Economy and Society* 10, 2 (2017), 281–295.

[107] Dorothy E Roberts. 1997. Spiritual and menial housework. *Yale JL & Feminism* 9 (1997), 51.

[108] Jennifer A Rode. 2011. A theoretical agenda for feminist HCI. *Interacting with Computers* 23, 5 (2011), 393–400.

[109] Yasaman Rohanifar, Priyank Chandra, M Ataur Rahman, and Syed Ishtiaque Ahmed. 2021. Money whispers: Informality, international politics, and immigration in transnational finance. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–14.

[110] Chiara Rossitto, Henrik Korsgaard, Airi Lampinen, and Susanne Bødker. 2021. Efficiency and Care in Community-led Initiatives. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–27.

[111] Louise Ryan, Rosemary Sales, Mary Tilki, and Bernadetta Siara. 2008. Social networks, social support and social capital: The experiences of recent Polish migrants in London. *Sociology* 42, 4 (2008), 672–690.

[112] Johnny Saldaña. 2021. The coding manual for qualitative researchers. *The coding manual for qualitative researchers* (2021), 1–440.

[113] Nithya Sambasivan, Julie Weber, and Edward Cutrell. 2011. Designing a phone broadcasting system for urban sex workers in India. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 267–276.

[114] Pedro Sanches, Vasiliki Tsaknaki, Asreen Rostami, and Barry Brown. 2020. Under surveillance: Technology practices of those monitored by the state. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–13.

[115] Marén Schorch, Lin Wan, David William Randall, and Volker Wulf. 2016. Designing for those who are overlooked: Insider perspectives on care practices and cooperative work of elderly informal caregivers. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 787–799.

[116] Mariacristina Sciannamblo, Marisa Leavitt Cohn, Peter Lyle, and Maurizio Teli. 2021. Caring and commoning as cooperative work: A case study in Europe. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–26.

[117] Alpa Shah and Jens Lerche. 2020. Migration and the invisible economies of care: Production, social reproduction and seasonal migrant labour in India. *Transactions of the Institute of British Geographers* 45, 4 (2020), 719–734.

[118] Donghoon Shin, Jaeyoon Song, Seokwoo Song, Jisoo Park, Joonhwan Lee, and Soojin Jun. 2020. TalkingBoogie: collaborative mobile AAC system for non-verbal children with developmental disabilities and their caregivers. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–13.

[119] Anubha Singh, Patricia Garcia, and Silvia Lindtner. 2023. Old Logics, New Technologies: Producing a Managed Workforce on On-Demand Service Platforms. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–15.

[120] Lotika Singha. 2019. *Work, labour and cleaning: The social contexts of outsourcing housework*. Policy Press.

[121] Marie Louise Juul Søndergaard and Nadia Campo Woytuk. 2023. Feminist Posthumanist Design of Menstrual Care for More-than-Human Bodies. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–18.

[122] Velvet Spors and Imo Kaufman. 2021. Respawn, Reload, Relate: Exploring the Self-Care Possibilities for Mental Health in Games through a Humanistic Lens. *Proceedings of the ACM on Human-Computer Interaction* 5, CHI PLAY (2021), 1–31.

[123] Susan Leigh Star and Anselm Strauss. 1999. Layers of silence, arenas of voice: The ecology of visible and invisible work. *Computer supported cooperative work (CSCW)* 8 (1999), 9–30.

[124] Angelika Strohmayer, Jenn Clamen, and Mary Laing. 2019. Technologies for social justice: Lessons from sex workers on the front lines. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–14.

[125] Lucy Suchman. 1995. Making Work Visible: Communications of the ACM. (1995).

[126] Lucille Alice Suchman. 2007. *Human-machine reconfigurations: Plans and situated actions*. Cambridge university press.

[127] Yuling Sun, Xiaojuan Ma, Silvia Lindtner, and Liang He. 2023. Data Work of Frontline Care Workers: Practices, Problems, and Opportunities in the Context of Data-Driven Long-Term Care. *Proceedings of the ACM on Human-Computer Interaction* 7, CSCW1 (2023), 1–28.

[128] Matthieu Tixier, Gérald Gaglio, and Myriam Lewkowicz. 2009. Translating social support practices into online services for family caregivers. In *Proceedings of the 2009 ACM International Conference on Supporting Group Work*. 71–80.

[129] Austin Toombs, Laura Devendorf, Patrick Shih, Elizabeth Kaziunas, David Nemer, Helena Mentis, and Laura Forlano. 2018. Sociotechnical systems of care. In *Companion of the 2018 ACM conference on computer supported cooperative work and social computing*. 479–485.

[130] Austin Toombs, Shad Gross, Shaowen Bardzell, and Jeffrey Bardzell. 2017. From empathy to care: a feminist care ethics perspective on long-term researcher–participant relations. *Interacting with Computers* 29, 1 (2017), 45–57.

[131] Austin L Toombs, Shaowen Bardzell, and Jeffrey Bardzell. 2015. The proper care and feeding of hackerspaces: Care ethics and cultures of making. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*. 629–638.

[132] Austin L Toombs, Andy Dow, John Vines, Colin M Gray, Barbara Dennis, Rachel Clarke, and Ann Light. 2018. Designing for Everyday Care in Communities. In *Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems*. 391–394.

[133] Angie Tran. 2013. *Ties that bind: Cultural identity, class, and law in Vietnam's labor resistance*. Southeast Asia Program Publications.

[134] Joan Tronto. 2020. *Moral boundaries: A political argument for an ethic of care*. Routledge.

[135] Joan C Tronto and Berenice Fisher. 1990. Toward a feminist theory of caring. In *Circles of care*. Suny Press, 36–54.

[136] Dhaval Vyas and Tawanna Dillahunt. 2017. Everyday resilience: Supporting resilient strategies among low socioeconomic status communities. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–21.

[137] Ron Wakkary. 2021. *Things we could design: For more than human-centered worlds*. MIT press.

[138] Jenny Waycott, Ryan M Kelly, Steven Baker, Barbara Barbosa Neves, Kong Saoane Thach, and Reeva Lederman. 2022. The role of staff in facilitating immersive virtual reality for enrichment in aged care: an ethic of care perspective. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–17.

[139] Gemma Webster and Vicki L Hanson. 2014. Technology for supporting care staff in residential homes. *ACM Transactions on Accessible Computing (TACCESS)* 5, 3 (2014), 1–23.

[140] Lauren Wilcox, Renee Shelby, Rajesh Veeraraghavan, Oliver L Haimson, Gabriela Cruz Erickson, Michael Turken, and Rebecca Gulotta. 2023. Infrastructuring Care: How Trans and Non-Binary People Meet Health and Well-Being Needs through Technology. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–17.

[141] Mary V Wrenn and William Waller. 2017. Care and the neoliberal individual. *Journal of Economic Issues* 51, 2 (2017), 495–502.

[142] Zheng Yao, Silas Weden, Lea Emerlyn, Haiyi Zhu, and Robert E Kraut. 2021. Together but alone: Atomization and peer support among gig workers. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–29.

[143] Rosemarie Zagarri. 1992. Morals, manners, and the Republican mother. *American Quarterly* 44, 2 (1992), 192–215.

[144] Angie Zhang, Alexander Boltz, Chun Wei Wang, and Min Kyung Lee. 2022. Algorithmic management reimagined for workers and by workers: Centering worker well-being in gig work. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–20.