Feminist Care in the Anthropocene: Packing and Unpacking Tensions in Posthumanist HCI

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ABSTRACT

As posthumanist or post-anthropocentric research in HCI and design proliferates and further commits to working *with* more-than-humans, design research practitioners are left with many open questions and uncertainties with how to productively engage with more-than-humans in their thinking and working. This paper present results from a workshop with 17 researchers working at the intersection of care ethics and posthumanism to highlight tensions in posthumanist engagement aimed at unpacking some of the challenges, obstacles, and questions encountered by researchers interested in more-than-human centered design. In foregrounding tensions with representation, legitimization, unseen labor, and material narratives we contribute to a design research agenda which seeks to explicate and challenge dominant anthropocentric forces from design. We conclude by discussing epistemological care and urge practitioners to take up new ways of imagining through truly messy methods which contribute to a feminist unsettling of HCI's methodological commitments, practices, and praxis.

CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); HCI theory, concepts and models.

KEYWORDS

Additional Keywords and Phrases care, ethics, posthumanism, workshops, feminisms, feminist, design, methods, Anthropocene, more-than-human, Indigenous, Knowledge

1 INTRODUCTION

The Anthropocene is a proposed geological age where 'humans' (as a recklessly homogenized collective [85]) are the primary force of change or harm to planetary systems. Discourses in Human

Computer Interaction (HCI) and related fields such as Science and Technologies Studies (STS) have embraced this term and work to understand anthropocentric ways of thinking and knowing. They aim to characterize the political, epistemological, and ontological exceptionalism from which human's many exploitative and destructive activities originate. Complicit in these effects, HCI designers and researchers have begun to see their role, at best, as *"sustaining the unsustainable"* [52] or at worst as "*defuturing*" [ibib:10] by means of actively negating futures for humans and non-humans through unsustainable or irresponsible designs. If, as feminist STS scholar Lucy Suchman reminds us, design's agenda is to produce *"technologies as knowledges objectified in a particular way"* [106:3] then practitioners have rightfully begun asking what kinds of things, worlds, or futures are being produced from that anthropocentric and objectifying standpoint. According to Colombian American anthropologist Arturo Escobar, the field requires *"a significant reorientation of design from the functionalist, rationalistic, and industrial traditions from which it emerged, and within which it still functions at ease, towards a type of rationality and set of practices attuned to the relational dimension of life"* [46:42]. In response to these concerns, HCI has increasingly turned to Euro-Western posthumanist scholarship which rejects human exceptionalism and positions humans' agency as distributed amongst a web of non-human forces in which humans participate but to not intrinsically control. Often in response to the climate crisis, HCI has adopted posthumanist philosophies in an attempt to "de-center" humans from within. Posthumanist or post-anthropocentric research in HCI and design has been growing with projects ranging from designing for human-fungi survival [81], to wearable designs for environmental speculation [31], to expanding participation methods to include non-humans [6], to name only a few. However, as the discipline continues to grapple with existing and emerging theories and practices to reframe design, many uncertainties with how to productively embody, design, and engage with posthumanist design research remain.

With these concerns comes a need to care in new and scalar ways. As a means of accounting for those *"relational dimension of life"* called for by Escobar, researchers have turned to care ethics as a strategy to explicate and challenge dominant anthropocentric forces from design. Care as a feminist practice is about attending to what, how, and when things get caring attention and come to matter and what, how, and when things don't. It is a relational, embodied, and ongoing practice which is necessarily particular. So, as practitioners work to understand and express non-anthropocentric alternatives for living in worlds *"as well as possible"* [48:40] we similarly need methods, capacities, and an ethic which is relational, particular, and non-just-human centered.

In 'Letters to Joan Tronto,' feminist scholars Talevi, Bailer, and Karjevsky ask what we need to *"pack with us and what to unpack amongst us"* [95:40] as people who care about care. Inspired by their metaphor (which conveys the importance of the journey not over but alongside the destination), this paper contributes learnings from the workshop titled Alternative Care Translations: A Workshop Using Care as a Lens for Speculative Posthumanism. This workshop gathered designers, researchers, philosophers, and artists working at the intersection of care and posthumanism to explore practices, theories, and open questions around how we actually go about negotiating those collaborative (or more-than-just-human) determinations of *"as well as possible."* Feminist care ethics was a critical lens for grounding the workshop's activities as well as scaffolding attendants' reflections, *"not as a stable heuristic but a context driven, and relational tool for both doing and noticing, not necessarily in that order"* [72:12]. For STS scholar María Puig de la Bellacasa, *"care is relational per se. . .this also means that an understanding of human agencies as immersed in worlds made of heterogeneous but interdependent forms and processes of life and matter, to or not to care about/for something/somebody, inevitably does and undoes relation"* [91:69]. The polyphonies between a care ethics and posthumanist agenda provided rich foundational and material points of departure for speculating alternative modes of more-than-human care.

Care, as a political, ethical, and material engagement with the excluded or devalued has long been of concern for feminist thinkers [66]. However, when it comes to more-than-human relations, the place-based experience (e.g., [73]) and scholarly discourse of Indigenous thinkers and activists (e.g., [107, 111, 124]) have largely been excluded or devalued. Euro-Western discourses often treat the Anthropocene (and undergirding Cartesian divide) *"as a teleological fact implicating all humans as equally culpable for the current socio-economic, ecological, and political state of the world"* [111:252]. However, there are knowledge systems which have long understood the theoretical and lived reality of the infinitesimal relationality and reciprocity of life, climate, knowing, and being [112]. In addition to the feminist Euro-Western body of theoretical work on care and posthumanism, this paper turns to Indigenous Knowledge (or Indigenous Ecological Knowledge) not just to amplify voices, inspire readers through colorful metaphor, romanticize ways of life, or offer ornaments to reckon with the authors' (or possibly readers') lack of prior engagement with Indigenous cosmologies which proceed and exceed modern posthumanist thought. Rather, we are motivated by a humble and genuine desire to learn from scholars and exemplars whose place-based and relational praxis has a lot to teach. The authors are Euro-Western scholars who have benefited from settler colonialisms in the USA and UK which have systematically displaced and suppressed the very ideas and individuals relied upon in this paper. So, while the authors have tried to understand and learn from Indigenous perspectives, we do not claim them as our own and recognize the invaluable yet unidirectional benefit they provide. In engaging with these ideas, we must acknowledge the uneven and unjust frameworks upon which this work was built and disseminated.

As more researchers and designers undertake posthumanist or more-than-human projects we hope to contribute findings from these workshops which trouble enduringly normative and euro-centric ways of engaging with more-than-humans. By leveraging the expertise and emergent experience of individuals working with research artifacts, methods, and orientations towards posthumanist design and the politics and ethics of care, we explore how we might operate and conduct research differently in the face of such sticky normativity. We contribute to pluriversal design agendas through layering posthumanist, feminist, and Indigenous Knowledges combined with a making-as-knowing approach which foregrounds tensions with representation, legitimization, unseen labor, and material narratives. This work showcases how care ethics can be used to concretely attend to productions of subjects and objects and to how those anthropocentric mechanisms of production shape the capacities of care relations between humans and non-humans. Lastly, this paper contributes a discussion on epistemological care and urges practitioners to take up new ways of imagining through truly messy methods which contributed to a necessarily intersectional feminist unsettling of HCI's methodological commitments, practices, and praxis.

2 MORE-THAN-HUMAN RESEARCH IN HCI

Euro-Western design as a discipline has primarily concerned itself with human functionalism—with creating useful things to advance humans' needs and desires. As with Euro-Western design generally, HCI has historically privileged humanist ideals and agendas as it extracts, exploits, and overlooks non-human species, matter, and systems. However, as HCI scholars have begun to acknowledge the existential and material consequences of this humanist approach they are forced to reckon with their role in those consequences. Afterall, Ann Light et al. assert, *"we have claimed a stake in the production of futures"* [80:723] and therefore have sought alternatives in post-capitalist, post-anthropocentric, and posthumanist projects in an effort to counter those effects from within.

Although many of the predominant ideas in more-than-human HCI research are derived from, and readily present in, discourses of Indigenous scholars and activists, Euro-Western design and HCI scholars have 're-discovered' the need for an ontological repositioning to support these preferable futures [112]. To make this turn, scholars have relied heavily on the feminist Euro-Western body of theoretical work on posthumanism, which in essence, *"expands the circle of moral concern, extending subjectivities beyond the human species"* [17:3]. Feminist STS scholars like Donna Haraway have focused on bridging the gap between nature and culture towards a more relational 'natureculture' [59, 62] and emphasize networks and relationships of kinship rather than exploitation [61] while Braidotti [34] focuses on the bio-politics of human-centered ecological devastation. Feminist new materialists such as De Wolff [38] and Bennett [28] work to breakdown dichotomies of alive vs inert or agental vs non-agental warning that *"the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption"* [27:ix]. Karen Barad synthesizes new materialist and queer theories to propose a posthumanist, or agential realist, account which *"calls into question the givenness of the differential categories of "human" and "non-human," examining the practices through which these differential boundaries are stabilized and destabilized"* [14:808]. These and other

efforts argue in various ways to acknowledge existing and foster future relationships with actants both human and non-human which are less hierarchical.

To address the presumed need to support alternative techno-futures with flatter, more harmonious, and therefore more just and sustaining relationships with non-humans and our shared environments, there have been an increasing number of proposals to de-center design from within HCI (e.g., [24, 64, 80, 104, 109, 118]). Researchers have looked to these and other theories such as critical race and decolonial theory (e.g., [49]), object-oriented ontology (e.g., [123]), and care ethics (e.g., [71]). Projects in the field of Sustainable Human Computer Interaction (SHCI), in particular, have long been sensitive to the many co-constituting relationships between humans and nonhumans. To bring humans and ecologies into conversation, researchers have engaged in posthumanist ethnographies, for example, detailing symbiotic encounters with companion species [84], exploring ontological alternatives for agricultural technology [29], and using permaculture to show how technology can support working with nature rather than controlling it [83].

Although many of these projects remain more theoretically oriented, researchers have also productively grounded their inquiries in designerly practices such as photography to examine naturecultures [82], speculative design artifacts which explore personal and bodily encounters with climate change [31] or how repair and care can challenge hierarchical human-object narratives [72]. Researchers have adopted and adapted methodologies such as anthropologist Anna Lowenhaupt Tsing's 'arts of noticing' [116] to expand participation in research to non-humans [6], or to design with non-humans for collaborative survival [81]. Biggs et al. blend 'arts of noticing' with making practices to interrogate their psychological attachment to the subject/object hierarchy, describing it more as a subject/abject relationship [30]. Jönsson et al. borrow from Barad's notions of posthumanist performativity to introduce 'performative prototypes' which engage in materially speculative co-design with humans and non-humans alike [69].

These projects share a commitment to working with design as a discipline and phenomena to conceive of and realize better futures for more than just humans. However, the project is scalar, it is plural, and the work of self-critiquing and challenging some of its longest-standing commitments has just begun. We argue that a posthumanist design agenda must materially attend to its ethical commitments in connection to its ontological and epistemological ones—troubling and nuancing prevailing notions of justice and agency as entangled, unfixed, and a bumpy rather than flat territory. Without reducing one to the other (or suggesting that either have all the answers), this paper will attempt to demonstrate that feminist ethics of care and Indigenous Ecological Knowledge are well suited to the task. Although originating from and diverging to quite different places these two bodies of knowledge share a faithfulness to relational understandings and expressions of subjects, labors, places, and temporalities which are based in concrete differences rather than universalized objectifications.

3 ETHICS OF CARE AND RELATIONALITY

The notion of an ethical imperative to recognize the life-giving relationships between humans and non-humans (and that such an ethic would account for how the past is simultaneously enacted in the present, therefore shaping how we conceptualize the future) is well understood in many Indigenous philosophies of ecology. Papaschase Cree scholar of Pedagogy Dwayne Donald describes such an ethic—ethical relationality—as *"an ecological understanding of human relationality that does not deny difference. . .This form of relationality is ethical because it does not overlook or invisibilize the particular historical, cultural, and social contexts from which a particular person understands and experiences living in the world. It puts these considerations at the forefront of engagements across frontiers of difference"* [45:6]. Although Donald developed this idea of ethical relationality in the context of Canadian-Indigenous curriculum it is important to understand the breath of Donald's notion of ecology (from Cree and Blackfoot philosophies) which entails *"paying attention to the webs of relationships that you are enmeshed in, depending on where you live. So, those are all the things that give us life, all the things that we depend on, as well as all the other entities that we relate to, including human beings"* [44]. Henceforth, an *ecological* understanding of human relationality and ethical responsibility is a critical point of departure both from Kantian ethics but also from many approaches to euro-centric more-than-human research which, in its zeal to decenter humans, erases rather than recognizes human differences—effectively emancipating humans from that ethical imperative.

Feminist ethics of care is similarly committed to understanding interdependence or relationality as an essential organizing force in the world [112] while stressing how those relations are necessarily particular and situated [45] and privileges responsibility and reciprocity [48] in its understanding of those relations. Although historically oriented towards problematic human-human relations, it is precisely because of care ethic's concrete and particularized (vs generalized) consideration of selves and others [25] when interrogating the processes, matterings, and materials needed to maintain a world that feminist STS scholars like María Puig de la Bellacasa see such potential in *"involving a feminist vision of care in the politics of things [which] both encourages and problematizes the possibility of translating ethico-political caring into ways of thinking with non-humans"* [91:30]. In her invocation of 'thinking with,' Puig de la Bellacasa suggests not just an epistemic relationship, but that care is at the heart of matters all along a *"naturecultural ontological continuum"* [ibib:52], suggesting that looking into the ethico-politics of care for agencies, things, and entities opens possibilities of understanding and representing their relationships without 're-objectify' them.

Although care ethics has a robust legacy within feminist study (e.g., [5, 25, 48, 66]) and STS (e.g., [23, 67, 86 it has a relatively new (though generative) and predominantly human-centered history within HCI and design (e.g., [1, 12, 26, 94]). Care as an ethico-political nexus has proven a potent way to understand technology-mediated social spaces like a home (e.g., [19]), communities such as hacker collectives (e.g., [113]) or to trouble researcher / participant engagement in general (e.g., [77, 78, 115]). A recent strand of HCI has used care ethics as both theoretical and material medium for doing research with non-humans or not-just-humans. For example, Bardzell et al. analyzed ethnographies of farming practices to speculatively imagine how HCI might shift away from anthropocentric functionalism in pursuit of more care-ful relationships [17]. Key

et al. used care ethics as an analytic and speculative lens to offer alternative design considerations through more-than-human frameworks for embodiment, positionality, temporality, and reciprocity [71]. Wakkary uses care to make visible the politics and ethics of things—with which designers (or co-biographers) need to more fully engage if they ever hope to design for more-than-human-centered worlds [118].

These projects work to shift an underlying question in more-than-human HCI from 'how can humans care more' to *"what happens to our work when we pay attention to moments where the question of 'how to care?' is insistent but not easily answerable"* [91:7]. With this uneasy insistence comes opportunities but also responsibilities to address the effects of those ethical conditions. We argue it is crucial to adopt non-anthropocentric ethics as an essential process of worlding when reworking those conditions. In the same way that posthumanist HCI has been driven to reject boundaries between human and non-human, *"such a posthuman ethics contradicts the humanist assumption of a proper boundary between ethics and politics, agency and subjectivation, autonomy and dependence"* [10:2]. An attention to the entangled ethics of things might resist universalizing tendencies by encouraging more specificity to the forces sustaining perceived boundaries between particular humans and particular non-humans. Lastly, we argue that such an ethical orientation works to keep humans responsible to an ethical imperative to recognize non-human labors and agencies through acknowledging difference. Within the current discourse on more-than-human HCI we find it pertinent to remember Puig de la Bellacasa's words: *"care is not about fusion; it can be about the right distance"* [91:5].

4 ALTERNATIVE CARE TRANSLATIONS WORKSHOP

To open up conversation and tease out tensions with posthumanist engagement two workshops were held over the course of several weeks with 17 participants. The primary goal was to engage in posthuman speculation vis-a-vis care. This was done through two individual embodied speculative activities followed by small group discussions and a final collective group discussion at the end.

As designers and design researchers (especially as research-through-design, critical design, and speculative design expand and develop) the need for practice as well as theory to advance a posthumanist agenda is made clearer and more urgent. This work is part of a lineage of workshops conducted in HCI which uses designerly methods such as rapid prototyping (e.g., [8]) sketching (e.g., [105]), other forms of 'thinking through making' [126] or embodied speculation [36] with participants. In this case, participants engaged in making in order to generate *"back-talk"* [97:79] to discuss with other practitioners, creating a materially discursive workshop. Çerçi et al.'s analysis of how probes are used in design research assert that when designers engage in making it amplifies designerly tendencies, brings materials into conversation, captures current interpretations, and foregrounds decision-making [37]. These were key elements to consider for practitioners trying to disrupt and interrogate their own mental schema, as humans trying to de-center humans in design.

While workshops with other researchers are incredibly common, as conference activities (e.g., [7]), to pilot methods, share practices

(e.g., [47]), develop new directions (e.g., [102]) etc. they are less commonly reported in archival publications (see e.g., [11, 92, 128] as notable exceptions). One related trend in HCI is for small groups of scholars to engage in collective reflection, retrospective, or ethnography (e.g., [13, 40, 55, 68, 127]) as part of a reflective practice to *"re-understand their own role in the technology design process"* and *"uncover and alter the limitations of design practice"* [98:7]. In these and other first-person accounts, researchers become research participants. As is the case with duoethnography, trioethnography, etc., each person's experiences and reflections are positioned in dialogue with other research participants' [96] resulting in refractions, parallels, juxtapositions, and debate. These were foundational aspirations for the Alternative Translations Workshop. Further inspired by critical reflexive practice in feminist HCI [18], our process used participants' dialogic accounts to examinate the situated ethico-political underpinnings of designs, design practices, and designer/researcher positionality in an attempt learn and unlearn together.

4.1 Recruitment

To realize collective and discursive reflection on researchers' personal approaches to posthumanist and care-ful design we recruited practitioners working with either or both theoretical bodies. Although most of the participants engage in that work via HCI we choose not to limit the participant pool to technology spaces alone as other disciplines such as anthropology, philosophy, and art have made significant contributions to posthumanist and care theory which are germane to HCI. The initial pool of potential participants consisted of 38 individuals which were identified through a process of literature review, a call to participate in the Care Matters reading group (organized by anthropologists Ioanna Manoussaki Adamopoulou and Emilie Glazer for which the first author is a member), and through the recommendation of fellow researchers who's networks extended out to include early stage researchers and PhD students whose interests and knowledge might not be well represented in current literature. Each of these individuals were emailed a brief which explained the purpose, goals, the general structure of the workshop, and invitation to attend one of two online sessions. From this process, 17 participants were confirmed, 9 for workshop 1 and 8 for workshop 2.

Although the participants represent a diversity of experience, methodological practice, theoretical grounding, worldviews, and areas of discipline, the original list of 38 was by no means exhaustive. Researchers were almost entirely from the Global North for example, and selection of the final 17 participants was made based on pragmatic factors such as availability and the desire for some symmetry across the two sessions in terms of overall number of participants as well as expertise. This process of selecting participants can certainly be seen as a limitation of this work which will always be partial. However, we see this limitation, in part, as the result of a genuine effort to assemble a multi-disciplinary group capable of the types of materially discursive refractions, parallels, juxtapositions, and debates mentioned earlier in the paper while simultaneously recognizing that we can and should do better.
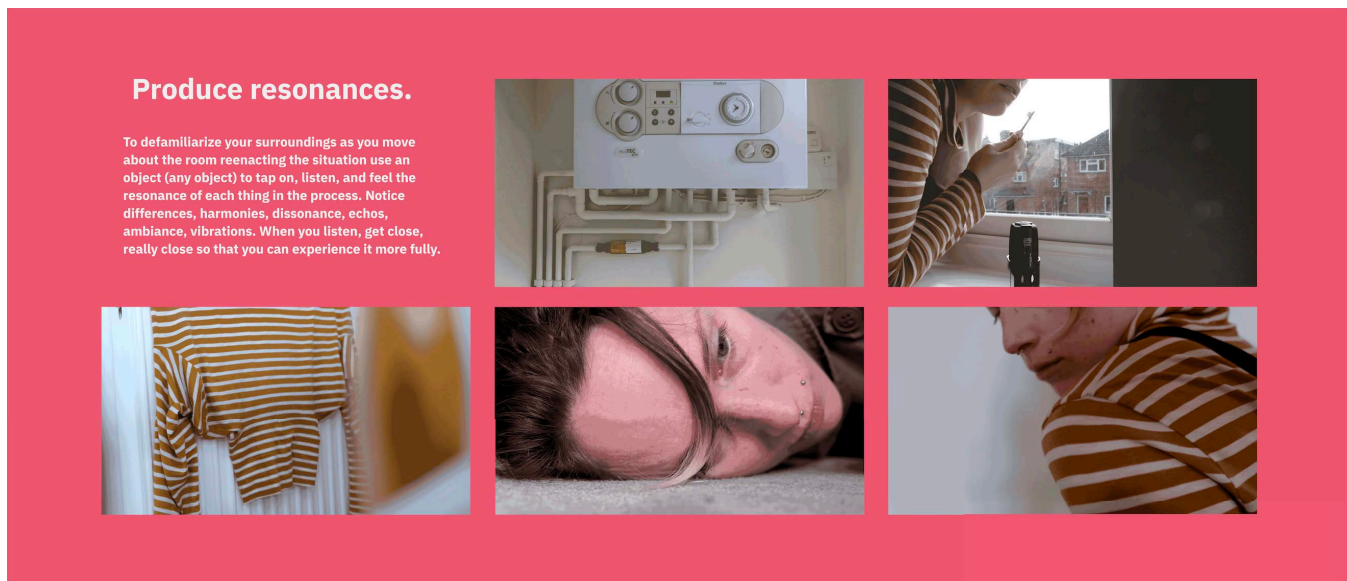
Figure 1: A screen capture of the Miro board with GIFs of the first author demonstrating activity 1: Micro-Situation Reenactments. The micro-situation demonstrated here is 'putting on a shirt.' Sonic phenomena were created using a bone key, radiator, carpet, window, skin, hair, water heater, and more.

4.2 Participants

Researchers who participated came with their own sets of practices, knowledge, concerns, and dilemmas which were equally valuable and vital to the discursive goals of the workshops. Participants' research projects range from exploring the agentic materiality of human-data relationships [39], posthuman design for transitions to renewable energies [93], how care ethics can advance pedagogy [99], the UX of climate change [22], blending postphenomenology and thing-perspectives [88], using the practice of BioArt to explore relational ontology [51] and arguing for the integration of a feminist care ethics perspective in HCI [115] to name just a few examples (see appendix for further details on participants).

However, because of the critical, reflective, and multidisciplinary nature of the workshops, participants occupied a somewhat dual role, at once expert researchers and research participants. As such, participants will be referred to by their initials as a narrative device reflecting the liminality and at times vulnerability of the workshop space when participants reflexively fluctuated between discussing nascent experiences and deeply considered notions.

4.3 Structure and Activities

To broaden reach and accommodate geographically diverse participation, each workshop took place online via Zoom and Miro and lasted approximately 2.5 hours. The sessions began with a brief introduction by the first author to help frame goals and activities of the session. Participants were invited to introduce themselves and share what they hoped to get out of the event. The workshop consisted of two main activities and a final group discussion. Both activities centered around the theme of translations. As art curator and philosopher Nicolas Bourriaud states: *"translation always implies adapting the meaning of a proposition, enabling it to pass from*

one code to another... Every translation is inevitably incomplete and leaves behind an irreducible remainder" [33:30]. In foregrounding that human-nonhuman translations will always be reductions, it was our hope that participants might begin to uncover ways to take responsibility for—and attend to the specificity of—how those reductions, adaptations, and remainders are produced, as a matter of ethics and care.

Activity 1: Micro-Situation Reenactments. This activity was designed to enlarge participants thinking [25] through resonant translations. Participants were asked to choose a micro-situation (inspired by [71]), which could be a ritual, a habit, a lark, a happening (e.g., milk being delivered to the front door, rain washing away your kid's sidewalk chalk, brushing your teeth, sun fading a rug near a window, etc.) to physically reenact (Figure 1). In this activity, participants used their homes as companion landscapes and partners in these activities to think co-speculatively with. During their reenactments participants created new sonic phenomena and were more attuned to existing ones by tapping, rustling, grinding, swishing, etc. as they reenacted and noticed differences, harmonies, dissonances, echoes, ambiance, and vibrations (Figure 2). Finally, they translated or annotated their experiences which they discussed in small groups of 3-4 after completing their own reenactments. Participants were provided a series of prompts to guide their group discussions such as: what labor (human and non-human) is involved at each step and how visible it is? What gets neglected so that this micro-situation can occur? In this scenario what is providing care and what is provided/denied care? And what do you think counts as a world?

The goal of this activity was not to see from the perspective of another thing, rather it was for participants to see their own bodies
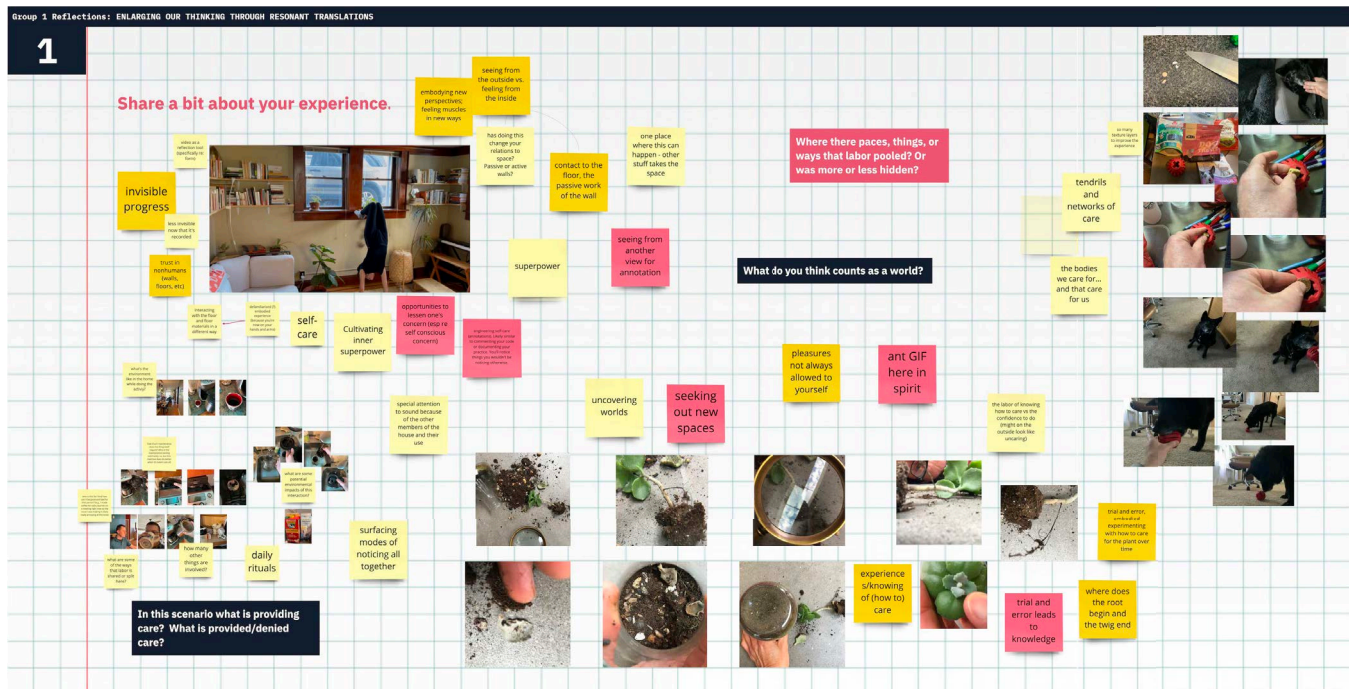
Figure 2: A screen capture of the Miro board where participants added images, notes, and GIFs of their own micro-situation reenactments from activity 1. Examples of micro-situations represented above are (from left to right) doing a handstand, making coffee, repotting a plant, and medicating a dog.
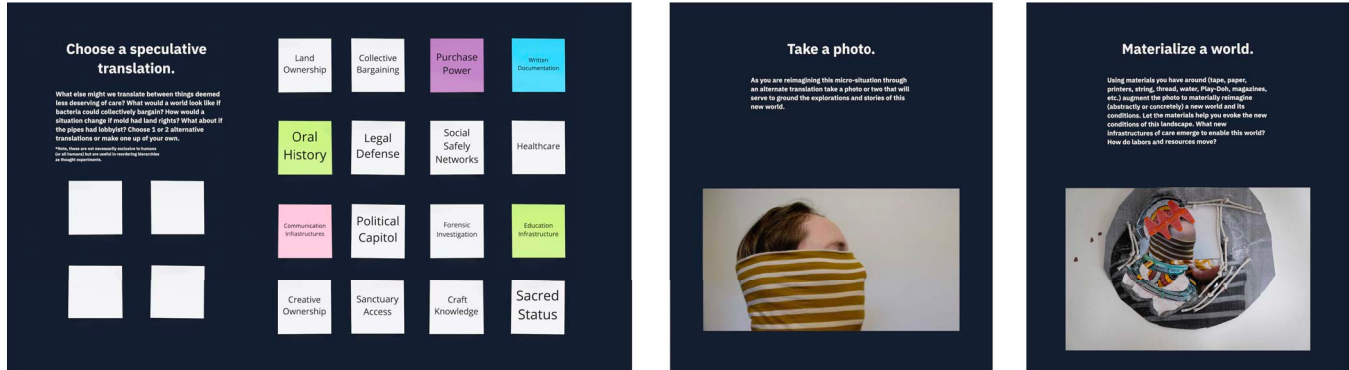

Figure 3: A screen capture of the Miro board where the first author demonstrated activity 2: Speculative Translations.

in thicker relation to other things (so that they might begin to challenge those relational hierarchies) through embodied translations. The aim was to tune in so that non-human liveliness might reach a point of expressivity, legibility, and ultimately translatability allowing a particular world to emerge to a particular human. This is essential when attuning to the particular conditions (rather than voices) of more-than-human relations and engaging them critically.

Activity 2: Speculative Translations. The second activity was aimed at exploring alternative care relationships through speculative human-thing translations. This activity was very much inspired by Tsing's writing on translations in the context of human-mushroom relations. She writes: [capitalism] *"translates across living*

arrangements, turning worlds into assets. . . Alienation is that form of disentanglement that allows the making of capitalist assets...from all kinds of livelihoods, human and non-human" [116:133]. Tsing's insight potently provokes the speculative question: then what else might we use to translate between entangled worlds? So, for the second activity's move towards speculation we asked participants to experiment or play with translating other conditions by expanding or redirecting who and what gets attention from individuals or regimes of care.

Participants each choose one condition such as land ownership, oral history, sanctuary status, etc. to translate between non-humans
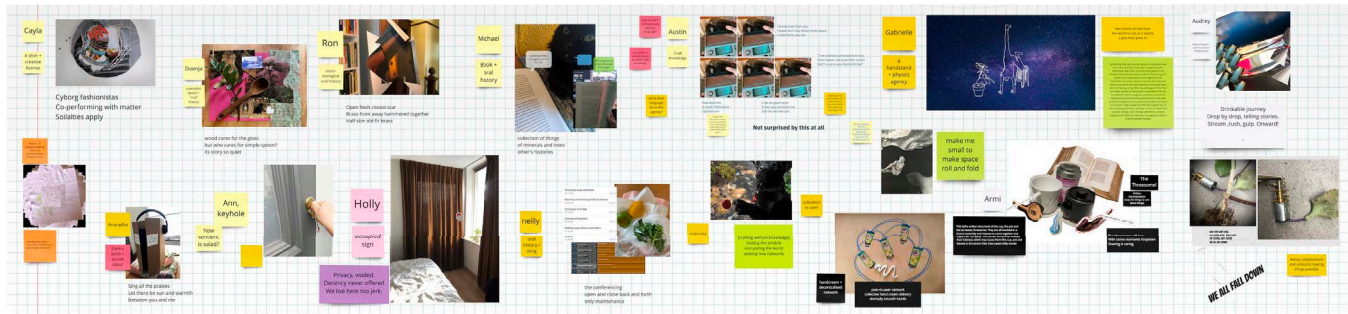
Figure 4: A screen capture of the Miro board where participants added images, sketches, collages, notes, audio files, object assemblages, and haikus from activity 2: Speculative Translations.
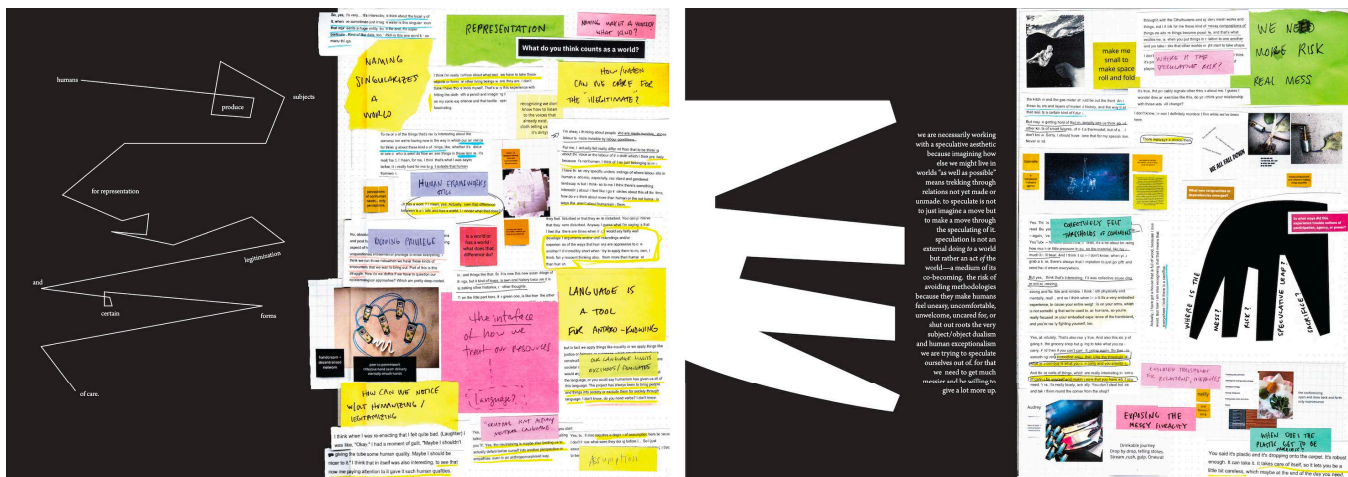

Figure 5: Spreads from the Alternative Care Translations Zine. The spreads were constructed from a mix of scanned collage materials taken from printed transcripts, Miro board screen shots, hand-drawn notes, post-its and digitally created visual elements.

in their micro-situation (Figure 3). They were then asked to materialize their speculative world using basic office and home supplies such as printers, tape, paper, string, thread, water, Play-Doh, magazines, etc. letting the materials help evoke the new conditions of the landscape. Participants could play with what new infrastructures of care would need to emerge to enable that world, or how labors and resources would move because of that translation. Lastly, participants wrote a haiku to punctuate their world. Participants would again discuss their experiences in the same small groups of 3-4 from the previous activity. The workshops ended with a collective group discussion where we tried to zoom out and identify complexities, uncertainties, and provocations for posthumanist research and design.

Combining modalities of reenactment, discussion, crafting, and writing throughout the workshop resulted in myriad creative outputs ranging from a sonic remix of the sounds of decaying food, to a hand drawn image of pneumatic tube infrastructure for hand cream, and a speculative assemblage with a succulent connected to a motor with an alligator clip, and more (Figure 4). These outputs were

important for analysis but also for participants to find interstices between thinking and doing, between human and non-human.

4.4 Making Sense of the Data

Workshop material in the form of transcripts, notes, and screen captures from the many Miro boards which include images, sticky notes, poems, collages, audio files, and GIFs served as the dataset for formal analysis and for a zine/token to thank workshop participants. Yet what began as two discrete activities (zine making and formal analysis), collapsed into a blended process of making, curating, coding, theme finding, and narrative building. The process began with an initial round of open coding with printed transcripts and screen captures cut into interesting snippets. These bits were then reviewed, organized, and reorganized by the first author into loose categories. Themes and an overall narrative developed with each step of the zine-making process (Figure 5).

Zines have been a part of the creative lexicon of HCI for some time ([50, 89]) and although not typically used as a tool for analysis there are parallels in HCI from which this analytic method can build. Desjardins and Key, for example describe the iterative
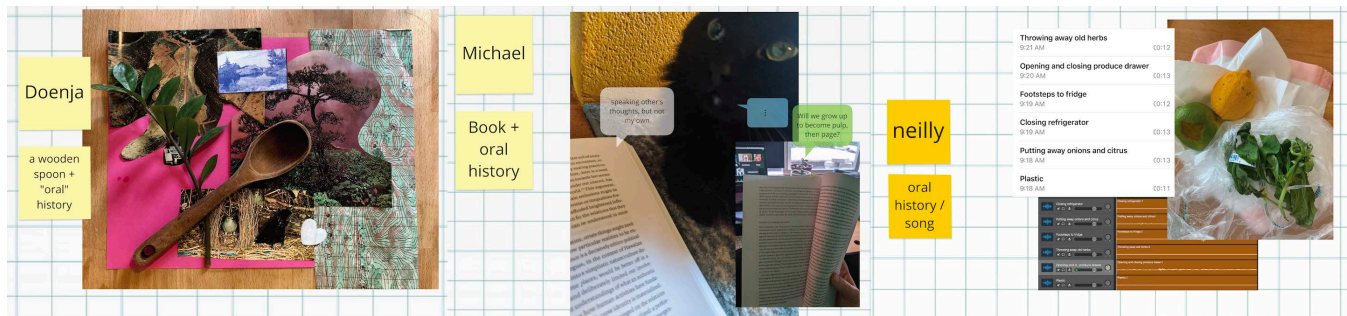
Figure 6: Three examples from activity 2: Speculative Translations with 'oral history.' (From left to right) DO's making coffee with a wooden spoon and oral history, MB's book reading and oral history, and NH's putting away groceries and oral history.

process of drawing a visual taxonomy of their RtD processes as an integral aspect of their reflective practice and analysis saying, "*These illustrations are not meant to be decorative, or mere accompaniments to the text. The lines themselves are the ways by which we were able to make sense of our own process*" [40:11]. In a similar manner, the iterative process of grouping content, ordering layout, even the choice of typeface opened space to embody, relive, and articulate the experiential qualities of the workshop alongside and in response to themes emerging from the data. This process was a way of tactilely making sense of the nuances, details, and contradictions present amongst the many forms of data. In the sections below we present findings from the analysis.

5 TENSIONS IN POSTHUMANIST RESEARCH

Below we present results from our critical analysis which highlights three tensions in posthumanist engagement aimed at unpacking some of the challenges, obstacles, and questions encountered by researchers interested in more-than-human design. Although by no means extensive, in foregrounding tensions with representation, legitimization, unseen labor, and material narratives we contribute to a feminist and care-ful departure from HCI's anthropocentrism towards the development of more relational approaches, understandings, and perhaps someday, futures.

5.1 The Representation Problem / Producing Legitimate Subjects of Care

Throughout the workshop, participants were often oriented towards questions of who, what, and how things got caring attention as a means of uncovering and reflecting on the relations around them. Although all the participants have contributed to or engaged in discourses which challenge dominant and human-centered mechanisms of knowledge production, when it came to expressing non-human relationships in the workshop, long standing tendencies towards representationalism often persisted. For example, during a group discussion of activity 2: Speculative Translations—DO noticed that *"almost half of them are speculative translations with oral history"* (Figure 6). It is likely not the case that almost half the participants found language (a distinctly anthropocentric process of knowing and organizing) the most interesting or generative speculation. Yet, as Barad reminds us, representationalism is *"a particularly inconspicuous consequence of the Cartesian division between*

"internal" and "external" that breaks along the line of the knowing subject" which *"is so deeply entrenched within Western culture that it has taken on a commonsense appeal. It seems inescapable, if not downright natural"* [16:806]. Participants had different ways of unpacking the reflexive dominance of this way of understanding and expressing possible alternative relations as when RW discusses the broader colonial humanist project saying *"humanism has given us all of this language. The project has always been to bring people and things into society or exclude them for society through language."* Speaking specifically from a research perspective he continues, *"I think we run those risks when we have these kinds of encounters that we want to bring out. Part of this is this struggle. How do we do this if we have to question our epistemological approaches? Which are pretty deep-rooted."* These examples reiterate some of the limits of epistemologies like language (specifically English in this context) as it is embroiled in socio-philosophical constructs which constrain the ability to understand and express non-human relations or conditions as they are rather than how they are represented by default as external rather than relational.

In questioning the subjects and objects of caring attention, participants not only confronted separations created through reflexive representationalism but also how those separations structured notions of deservedness. CR encountered this during activity 1: Micro-Situations, when reenacting the ritual of applying hand cream before bed as they became aware of how easy it was to apply humanist values and qualities to non-humans as a byproduct of noticing. They explained, "*When I was re-enacting that I felt quite bad. (Laughter) I was like, "Okay." I had a moment of guilt, "Maybe I shouldn't do this." Also, when I was doing it a couple of times just to hear the noise and think about it, it's like, "Okay, here I go giving the tube some human quality. Maybe I should be nicer to it." I think that in itself was also interesting, to see that now me paying attention to it gave it such human qualities."* The very act of attuning to the perceived experience of the hand cream reflexively caused CR to reconsider that care relation based on a supposed harm—asking should I care differently? And more importantly, why would I?

This nascent question of why a non-human (like the hand cream) would deserve different treatment was the subject of further discussion by another group. Because of SA's work around prisons and policing, they were particularly sensitized to how political mechanisms produce other humans worthy of care within these contexts,

sharing, "*I think there's a lot of pushback in the radical political circles I'm in about the language of humanizing as if somehow that produces a form of person that becomes palatable to people.*" SA takes the connection between needing to humanize (and the exclusionary politics therein) to build capacity to care and directs that towards non-humans saying, "*I think I'm really curious about what tools we have to take these objects or forms or other living beings where they are. I feel like I go in circles about this all the time. How do we think about more-than-human or the not-human in ways that aren't about humanizing them?*" Critically for SA, the 'we' in their question and concern implies not only individuals but regimes of care—of which research collectives are very much a part. This points to issues beyond mere individual representationalism and highlights the need to look deeper at institutionalized representationalism and how together they produce not just subjects external to humans but subjects worthy of care.

These frictions and contradictions with participants attempting to move beyond representationalism make clear how easy it can be to participate in or enable a dominant oppressive system of authority (i.e., humans) to produce subjects for representation (i.e., non-humans). Through these subject productions with more-than-humans, care is often contextualized as an integral ethic of 'humanity.' This allows non-humans to fall into the same trap as other humans in need of "our" help, rescue, saving, or stewardship which are the racialized, gendered, classist etc. "*politics of benevolence and compassion for a suffering human*" [110:141]. This phenomenon of joining the cognates human (individual separation), humanity (generalized entity), and humane (moral imperative) [ibid] is at the crux of how care and representationalism is entangled in legitimizations of non-humans as subjects of care which further entrenches a subject-object divide. These examples foreground work still to do in finding the mechanisms, materials, and willpower needed to interrogate the politics of benevolence and compassion for a suffering *entity*, or (perhaps more pointedly) *non-particularized ethical collectives of entities* (i.e., 'nature' or 'technology'). We argue this is critical if Euro-Western discourse hopes to move past those categorical representations and meet non-humans "*where they are.*" Furthermore, taking a cue from gender theorist Judith Butler's work on the production of legitimate (human) subjects beyond reflexive actions to account for the political or manufactured [35], designers and researchers need to confront their own individual and systematic representational power and authority present from within their hegemonic structures (i.e., the academy). It is time to take seriously an attention to how such productions of subjects pre-determines the texture and possibilities of care relations between humans and non-humans.

5.2 The Labor Problem / Labor is Progress, Labor is For the Living

Because care can be described as "*a cumulative effort of attentiveness and resilience [that] is easily overlooked*" [71:2] for humans and non-humans alike, discussion prompts for each activity often focused on questions of labor's movements, visibility, and effects, especially as they might shift or redistribute in an alternate care relationship. Despite a predisposition from many of the participants towards disrupting invisible labor hierarchies it took focused attention, effort,

and at times a real uncomfortability to locate the labor of anything outside of their own human experience. For example, when SA was reflecting on their experience producing and translating resonances (from activity 1) while reenacting cleaning their glasses in the morning they explain, "*I'm always thinking about people who are made invisible, whose labor is made invisible by labor conditions. For me, it actually felt really different from that to be thinking about the voice or the labor of the cloth which I think precisely because it's not human, I think of it as just belonging to me.*" SA then reflected on instances of material friction where non-human labor did emerge saying, "*for me it's recognizing that there were certain points where there was like a tension, like a potential snag of the material or the railing catching that, so at these points of resistance where I became aware of the labor.*"

This susceptibility to feeling like the sole bearers of labor was evident in all the groups at various stages. In some instances, participants contextualized the invisibility of more-than-human labor in relation to the lack of perceived progress of that labor. In the case of HR reenacting opening her bedroom curtain and disturbing some gnats she explained, "*I definitely perceived them as being disturbed and I guess the labor would be then to kind of achieve a homeostasis again.*" It took HR some time to recognize this form of non-human labor in part because labor is often seen as movement towards something as opposed to a going back, or as a focused effort to get somewhere new and perhaps better. Similarly, MB found himself in relation to a form of non-human labor closer to self-maintenance or persistence in the face of human intervention. When describing his micro-situation of reading a book, he explains, "*I'm pretty rough on books. I like to highlight. I mean, it's my book. I want to be able to engage with this book. So, it's, kind of, warped; it definitely had some use. It looks like it has been doing some labor while trying to withstand my engagement with it—putting up with me.*" For MB the non-human labor he connected to was neither progress forward nor movement back but a holding steady, or as RW referred to during the group discussion when describing a door "*trying to stay as a door*" in his 110-year-old house, "*that quiet labor of trying to stay together.*"

Although the previous examples of locating non-human labor were all discussed in the broader context of care and care relations, AL directly confronted the notion of labor *as* progress *as* care while thinking through her evolving emotional response when reenacting her micro-situation—opening the front door of her house. She recalls, "*I care for the house, but it's not necessarily caring for me. And then I was thinking, that's not fair. It cares a great deal. It's just that it's kind of quite a static form of caring.*" In the final group discussion of workshop 2, CG brings these ideas together when working through what it might mean to live in a world where an anthropocentric link between care, labor, and progress was severed or challenged. She wonders, "*If you had to treat everything with a level of care that you would a human, I don't know, I think you wouldn't get very much done. Maybe that would be a good thing.*" CG's provocation takes us one step further to suggest that human labor redirected away from a productivist frame might also be a form of self-care or collective care. Furthermore, her comment underscores that there is no universal way to care or be in relation. Those are necessarily particular and treating them as such (to care

for a door as a door rather than human) is better for both the door and the human.

This section illustrates how unproductive labor by non-humans which might be static, non-linear, or resilient gets marginalized and overshadowed by *"the persistence of a modern paradigm that associates the future with progress, with an ethico-political imperative to 'advance'"* [90:693]. By shedding light on these unseen labors, we caught glimpses into the ways in which care relations among entangled entities are similarly static, non-linear, resilient, and silenced. By mapping these relations through their labors, we arrived at a *"topology that defies any suggestion of a smooth continuous manifold"* [16:244]. Such a map highlights the agency of non-humans via their labor in ways which begin to resist humanization. Through the very process of locating these labors, participants were required to suspend humanist lenses which prescribe who and what has the capacity to labor in ways that were relationally particular. These acts of acknowledgment helped participants begin to reframe production and progress from linear to *"nonlinear enfolding[s]"* [ibid:244] which suggests an ontologically significant opening.

5.3 The Material Problem / Narratives of Pureness and Reconfiguration

The notion that *"nothing preexists the relations that constitute it"* [32:350] is an established ontological pillar of both care and posthumanist theory. As participants engaged in various forms of material reconfiguration throughout the workshops, they confronted long-standing narratives around what is perceived to be pure (i.e., preexisting relation to humans). Within these narratives are an unintended denial of non-human agency which exists outside of a human's representation. This has the effect of saying: nothing preexists the *representations* that constitute it—a damaging notion indeed. However, participants also experienced moments of reconfiguration which challenged the idea that human agency is self-derived and exists separate from its relation. In this section we will explore the connections we saw between these narratives and the ways they directly affected matters and conditions of care.

The phenomena of categorizing value based on material pureness was most present when directed at non-humans as in the case when AL was discussing with her smaller group why she felt a stronger connection and care for one item over another saying, "*So I think it is partly because it is just the most amazing living fabric. A lot of the fabric that we work with is so processed that you do not get a sense of its relation to the original material. I mean, in cotton you can kind of see it a little, but for most things their nature is just so extracted.*" Although her feelings and relationship to this item are more complex than we as deeply discussed, one element to that connection was the fabric's aesthetic proximity to its unprocessed origins, or rather its comfortable distance from human meddling. Additionally, romanticizing the material provenance of pure/impure divisions can produce narratives of sacrifice or suffering and therefore legitimize modes of care. This is a concept DO explored during the closing group conversation of workshop 1 when sharing why it felt easier to care for wood over metal: "*I am wondering now too, should we get that for metal as well? Are we just having a missed connection there because we cannot see it, because we cannot see the grain of how we can recognize the living of the tree? I wonder if there is a blind*

spot. . . You know something has been given up for the metal as well, it is just less direct, and then we cannot empathize with it as much." In her thinking, DO draws connections between pureness and care but also to living versus inert and suggests a danger in that blind spot is how it obscures those relations and limits potential forms of care. HR elaborates the tension between care and the fiction that what is living has more to sacrifice as the conversation evolves, "*I'm thinking about how a tree in its death, its materials are used to provide life for the other things in its ecosystem. That is a type of care that is contributing through its death. This is probably not the death that it evolved to become, the door, the spoon, the whatever. There was a care that it evolved to fulfill, and we took it out of that loop.*" HR's reflection cognizes the tree as a pure living thing with something akin to destiny, while recognizing *"there also maybe a danger is romanticizing materials like that."*

During activity 2: Speculative Translations, participants created physical expressions of speculative worlds in which care conditions were radically different. Critically, these were made as situated human bodies—as sites of enmeshed and particular perceptual difference. Thus, in addition to the things in and around their homes, participants' selves were positioned as materials to be playfully reconfigured. This position was often uncanny and unpleasant in the way it unseated a pure/reconfigured dualism for even brief intervals. RW describes the way he felt reconfigured during his speculative translation (redirecting socio-ecological oral history to a door hinge) saying, "*I felt that I was reconfigured now as a piece of material, that was my flesh. Then the history of my flesh, of the scar, and that was no different, I suppose, than the wood. These things are taken, rendered apart, put back together. . .but I suddenly felt, very quickly, a kind of affinity with the things that I was literally physically connected to. That, I guess, is a different configuration that did not exist for me before. I never made the connection between that particular door and my body in that way, until this workshop. But I did feel like an invasive species in terms of all the care relations that are already in place. I felt I did not belong here. Is it a new world? Do you think we created new worlds?*" "*Yes, definitely*" (MB). "*Definitely—it is surprising to me that I did that, and it definitely troubles me also*" (AR). RW's experience of feeling a simultaneous affinity for and rejection from the care relations in place among the other materials highlights a distinct ambivalence. From a researcher perspective, it is interesting and exciting to experience moments, however brief, of a relational ontology but there was a marked backlash as well. In the emergence of those worlds—those moments of heightened awareness of 'being with,' comes the uncomfortability of diminished power (agency), evoking questions of if we feel welcome anymore and are we ready to *feel* like outsiders?

Within these various material engagements with bodies and things we saw how researchers grappled with a morality based on pureness versus reconfiguration which treats entities (selves included) as categorical rather than particular or relational. Much like the 'pristine myth' construct of the North American wilderness in Indigenous scholarship which *"imagined an unopened wild landscape as pristine, pure, and unspoiled"* [57:100] (by Indigenous ways of life) which was *"born from the Manifest Destiny ideologies of western expansion"* [ibid:92], this fallacy and its moral consequence, is necessarily a kind of violent colonial erasure of already in-place and place-based relations which are undervalued because

they don't serve white anthropocentric visions of present and future domination. This kind of political interrogation of the 'pristine' is especially needed in design research as practitioners confront the moral consequences of what might seem like harmless aesthetic, material, and narrative choices. Furthermore, when researchers turn the lens in on ourselves as materials like any other, susceptible to the same political, moral, and ontological trappings of a pure versus configured dualism we are all too tempted to look away out of fear of our own erasure. Afterall, as feminist STS scholar Cecilia Åsberg uncomfortably reminds, *"we have never been purely human in the first place"* [10:9].

6 DISCUSSION

Recalling the metaphor of using this workshop to explore what we, as a research community, need to *pack with us and unpack amongst us* in the above sections we focused on unpacking three tensions with more-than-human engagement. To further trouble these tensions and trace where we see them link up, the sections below focus on what we might *pack with us* ideologically and tactically when navigating our way forward as practitioners committed to posthumanist design research.

6.1 The Knowledge–Care Loop / Towards Epistemological Care

Within the tensions detailed above is the seeming inescapabilty of anthropocentric epistemologies to reproduce anthropocentric ethics and modes of care. Through our explorations of how participants related to material reconfiguration and legitimizing subjects we begin to understand that what and how we know (epistemology) and what and how we care (ethics) are bound together in cycles of replication. By drawing a through line to seen and unseen labor as manifestations of uneven reciprocities we will attempt to paint a picture in this section of how we might attempt to know differently to care differently.

Within posthumanist HCI there has been much attention paid to alternate ways of knowing, to finding methods which push boundaries to encompass more-than-human voices and knowledges. However, during the final group discussion in workshop 1, participants began shifting away from trying to see through the eyes of an other (human or non-human) or understand their lived or even lively experiences. Instead, they focused on unpacking nonrepresentational ways of knowing. RW suggests that *"epistemological care might be to not know, might be to not give words to, might be to not categorize. There is a privileging or entitlement that we have to know, or we have to give it some way of knowing. Language does that. If it's not in language, it doesn't exist, or we're not communicating. I think your workshop gets at this and I think there are these epistemological care issues"* to which HR adds *"It's interesting because this not knowing, it's an important societal power mechanism to be exercised. It's a way to create order. It's a way to keep a perspective. It's also a way to humble, to recognize that there are just not things that you will be able to understand and just lean into that and accept it and find other ways to relate to it."*

We further develop this idea of epistemological care first as an interrogation of the knowledge-care loop, meaning we care to know how we know to care and second as an attempt to disrupt it. This

interrogation might begin with the assumption that humans can only perceive of a world from the outside [70]. From that distance one must perceive of things (human and non-human) as separate, categorical, legitimate, and in the case of many humans—and all non-humans—much less agentic. This vantage point allows moral judgment to be administer on top of others—as is the case with an ethics of justice. However, there are counter proposals within Indigenous scholarship where thinking/knowing and therefore agency are not merely humanist representations overlaid on top of *the* world— as if there was a separate and solid surface upon which to place these 'higher level' thoughts anyway. In her critique of Euro-Western onto-epistemological framing of agency, Haudenosaunee and Anishinaabe scholar of Indigenous Studies & Sociology Vanessa Watts describes 'Place-Thought' witch is *"the non-distinctive space where place and thought were never separated. . .based upon the premise that land is alive and thinking and that humans and non-humans derive agency through extensions of these thoughts"* [124:21]. For Watts, agency isn't a given for either humans or non-humans but emerges out of the relations between them in a place that rejects human/non-human separation. When applied to an ethics of care this adds consequence and nuance to how knowing (or thinking) differently might provide openings for caring relations to emerge which do not perpetuate separated, stabilized, and categorical ways of knowing-treating non-humans as less capable or with less ethical agency.

To help concretize and articulate mechanisms which might support disrupting the knowledge-care loop a feminist care ethics notion of asymmetrical reciprocities might provide a tactical edge. In care ethics reciprocity is not necessarily symmetrical (as in 'the golden rule' do unto others as you would have them do unto you) which is a generalized form of justice. Rather reciprocity is seen as complimentary [25] or asymmetrical and particular. This makes obligations to co-operatively maintain a world through concrete acts of care labor an ethical condition of those relationships rather than a moral application. This is an importance distinction because it means that human and non-human agency is equally bound up in those ethical conditions, yet not equally obligated or effected. We saw this manifest most clearly when looking into how non-human labor foregrounds the linkages between agency and care (as in AL's experience denying then coming to terms with how her home cares for her too).

This brings us to a key point: if care ethics is a condition of our entangled existence, where the particularities of those relation (not the abstracted perceptions of humans) are what materialize or actualize agency for humans and non-humans then all entities participate (labor) in how they come to matter. As a result, we argue that by following care labor and linking it to asymmetrical reciprocities, researchers have a concrete 'in' for tracing back through and addressing some of the ethico-onto-epistemological conditions of their relations in ways that interrupt the knowledge-care loop and perhaps begin the work of epistemological care.

Furthermore, we argue that this form of labor tracing could be used to create 'diffractive' maps of non-human relations. For Haraway, diffraction is the *"mapping of interference, not of replication, reflection, or reproduction. A diffraction pattern does not map where differences appear, but rather maps where the effects of differences appear"* [60:304]. Mapping the 'through' with which a situated

individual is understanding non-human relations might shift focus away from the feelings or experiences of non-humans (which require processes of representation and legitimization through humanist valuation) and turn to the interference patterns that get created by subject/object boundaries. Using DO's discussion about the purity of wood over metal as an example, this map would not be an account of what we know or assume about wooden spoons. Rather it would trace how those particular spoons, metal, and people are differentiated and how that difference matters for spoons, metal, and people in an inspirable ethico-onto-epistemological kind of way. Hence, the resulting map is not 'representative' of spoons, metal, or people categorically but has something to say about how the difference between them is produced and takes responsibility for how such practices come to matter. Because the labor needed to maintain such relationships and divisions are concrete responses to those differences, we argue that visibilizing those labors diffractively is one possible tactic for disrupting the knowledge-care loop.

In this way, posthumanist epistemological care for HCI might entail other diffractive methodologies for interrogation and disruption which seek not to replicate humanism, but which marinate in the unease and tensions of asymmetric reciprocities which may feel non-proximal, illegitimate, or lonely. Such epistemological commitments could resist the urge to tame or stabilize matter and matterings and create openings within ourselves as knowledge producers to rework those boundaries—a prospect which may be scary or unsustainable yet none the less is our responsibility.

6.2 Where is the Risk? / Towards a Different Kind of Imagining

Throughout the two workshops participants oscillated between enacting a morality based on categorical entities which are comfortably sperate to rejecting those categories and dualisms based on particular and embodied relations which were uncomfortably close. These encounters were marked by feelings of alienation, rejection, and being uncared for. As AB put it during her group's discussion of activity 1, *"I felt like I was interrupting their conference."* While exploring the romantic materiality of subject/object cuts it became clear that although those categories and dualisms are not absolutes, they possess a haunting aesthetic capacity to marginalize non-humans and humans alike.

As designers, makers, or creators of knowledge objects (constructed from an array of different materialities) we hold and have claimed some say in that aesthetic. And as researchers committed to posthumanist agendas we are necessarily working with a speculative aesthetic because imagining how else we might live in worlds "as well as possible" means trekking through relations not yet made or unmade. Therefore, it is worth considering how the origins and functions of speculation are more complex than they might seem and, as we will attempt to unpack here, there is a *real* risk in our speculations not being risky enough. For philosopher and social theorist Michael Halewood, 'successful' situated speculation *"renounces any faith in a settled world that can be immediately known. Instead, it launches itself from, and returns to a world-in-the-making, where one's speculations can only be assessed in terms of the effects and consequences that they produce as part of the making of the world"* [58:60]. Building off Alfred Whitehead, this is an important

distinction as it separates productive speculation from idle imagination [125]. For Halewood and Whitehead, to speculate is not just to imagine a move but to make a move through the speculating of it.

This idea is not new however, and an imaginative landscape can be productively thickened through Indigenous Ecological Knowledge. According to Haudenosaunee scholars of Indigenous Environmental Studies Joe Sheridan and Dan Longboat, *"Imagination, in its ecological sense, is the cognitive and spiritual condition of entwining with local and cosmological intelligences. Indeed, imagination is the spiritual medium of those powers that engage humans without humans being the prime movers of the act"* [101:370]. Although imagination in an Indigenous ecological sense and situated speculation share the belief that speculation is not an external doing *to* a world but rather an act *of* the world—a medium of its co-becoming—the two philosophies differ on what it means to a take a risk through that act. For Halewood the risk is twofold, it is in the uncertainty of where one will end up as the result of a speculation (because worlds are not fixed) and the socio-political consequences therein (i.e., ridicule from within the academy). For Sheridan and Longboat however, the consequences are much deeper. They explain, *"From a Haudenosaunee or Mohawk perspective, we notice that minds colonized by these assertions concerning the universality of imagination's origins and functions are contributing dimensions to larger conceits maintained by anthropocentrically biased cultures. Cultures colonized by these conceits tautologically confirm the interior sources of their intelligence"* [101:366]. In the context of imagining (here the paper will shift terms to bring the following ideas into alignment with Sheridan and Longboat's more consequential formulation) for more-than-human centered design futures, the risk of avoiding methodologies because they make us (Euro-Western researchers and participants) feel uneasy, uncomfortable, unwelcome, uncared for, or shut out roots the very subject/object dualism and human exceptionalism we are trying to speculate ourselves out of. This is an important distinction as it asserts that risk does not rest solely on the shoulders of a human speculator but that imaginative risk scales to the cosmological as a real and inseparable material of an entwined world.

In closing his essay on situated speculation Halewood concludes that 'successful' situated speculation is rare and very challenging to achieve. In analyzing the Alternative Translations Workshop against Halewood's notion of success as making a real move from a situated place to one which is unknowable, and which produces consequences and Sheridan and Longboat's element of risk to human self-perception, we realized instances of 'success' lay precisely in the moments where participants felt the most physically and emotionally troubled as they challenged perceived contaminants through embodying thresholds. This was the case when RW reconfigured his body as a door hinge and felt, but also affected, the boundaries between himself and those other materials. In that act of imagining he challenged the perceived containments of human and non-human 'successfully.' In the case of GB explaining to the group her process of imagining alternate care relations with her wall and floor (per activity 2) she begins by describing her daily handstand practice saying, *"it's a very embodied experience, because your entire weight is on your arms, which is not something that we're*

used to, as humans, so you're really focused on your embodied experience of the handstand, and you're really fighting yourself, too." GB used the physicality of her connection with the floor and of her own bodily resistance to this reconfiguration as starting points for reimagining what at first seemed like the *"passive work of the floor"* saying *"I came to realize that we both change, that I change with them, and that stability isn't fixed but relational, not rigid but a dance of trust between bodies."* For GB, embodying and fighting through thresholds of trust, stability, and autonomy within herself and the two surfaces allowed her to imagine/realize their relationship as more fluid—as something choreographed yet co-created.

The tactic of finding thresholds within a relationship and embodying them, making them something humans must feel and physically or emotionally endure also resonates with Sheridan and Longboat's understanding of imagination: *"Like everything Haudenosaunee, imagination has a place because* **imagination is a place**, *and because everything is connected to everything else, the encounter with imagination is a living communication within a sentient landscape"* (original emphasis) [101:369]. Simply put, imagination is not thinking differently but being differently because it is a part of our daily worlding practices. This last point underscores why HCI and design research needs to take speculation more seriously and why imagining should/does not solely reside in *our* minds. In some ways this is quite intuitive for a design audience yet as designers and researchers we are materials to be imagined as well and stand to benefit the most from these kinds of uncomfortable reconfigurations as we hold the potential to transfer that imaginative aesthetic through our research materials. After all, *"Imagination did not become a quality of a singularly human mind until mind severed itself from landscape and the depths of time. For the Haudenosaunee, imagination possesses no prehistory. Imagination became something other than what it is when mind went solo into Cartesian waters and lost sight of mythological shores"* [101:370]. HCI cannot run the risk of speculating more-than-human worlds from disembodied subject minds and needs to relocate critical practices of imagining back within landscapes and specifically between the boundaries or cuts which severed the two in the first place. Without these truly messy methods, design and research runs the risk of once again displacing the same elsewhere [15] from a position of nowhere [59]. As AT nicely surmised during workshop two's closing discussion, *"As there is with decay and these remixing, and these messy moments, I think they're not romantic. Even though I think we kind of want them to be."*

7 CONCLUSION

Although care can be described as a *"form of political imagination to fuel hope and desire for transformative action"* [110:137], relational ethics (like care ethics) are not an ideal, not an innocent, not a utopia. They are not safe, moral, or stable either. This paper reports on the analysis from a workshop which applied such an uneasy relational understanding of ethics to reveal and unravel tensions within posthumanist research practice but also to fuel a transformation of how design researchers might imagine and act differently within those practices. We have argued that is time to take seriously an attention to how subjects and objects are produced and to how those mechanisms of production shape the capacities of care

relations between humans and non-humans. This paper unpacks tensions within posthumanist design and research regarding representationalism, legitimization, unseen labor, and dualistic material narratives. Along the way we have left markers or cairns—small piles of stones delicately balanced atop one another to show how one has proceeded along a path which is unclear. It is our hope that these metaphorical cairns might contribute to orienting posthumanist design within feminist and Indigenous praxis through conveying their ability to highlight the thickness of our present and to thicken our futures because both make sense of being on earth as a necessarily interdependent and relational practice of maintenance rather than domination.

Although we have taken care to extract these tensions and responses, we recognize that engaging issues as deeply rooted as how to de-center design will likely not result in clear-cut directions or enunciations. We take to heart Puig de la Bellacasa's affirmation that speculative ethics cannot be a sanctuary for its positions and as a practice must stay "*aware and appreciative of the vulnerability of any position on the 'as well as possible'*" [91:7]. We admit to providing no 'answers' but believe that our process of investigating and responding matters more. In the words of Red River Métis/Michif scholar of STS Max Liboiron: *"methodologies—whether scientific, readerly, or otherwise—are always already part of Land relations and thus are a key site in which to enact good relations (sometimes called ethics)"* [74:7]. Where we have arrived is the result of a series of diffractive 'readings' built atop and throughout each other, beginning with how the workshop was conceived and curated, to the happenings which took place therein, and in the analysis presented here. This is not to say that if practitioners construct their research from messy diffractive methodologies, they are not accountable for their contributing outcomes. Rather, this underscores the importance and ethics of the journey not over but alongside the destination because we too are reconfigurable through our praxis in ways possibly more consequential than any other.

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APPENDIX

This appendix is meant to provide a brief introduction to each participant researcher and pointers to key publications or projects which are by no means exhaustive, but which help situate the starting points of each individual's research interests.

Workshop 1

Doenja Oogjes, a design researcher and PhD candidate in the School of Interactive Arts and Technology at Simon Fraser University uses postphenomenology to move beyond human-centeredness to explore more-than-human design practices [63] and relations with things often utilizing thing-perspectives [88]. Dr. Ann Light is a researcher in the School of Engineering and Informatics at the University of Sussex and the School of Arts and Communication at Malmö University. Her work critically investigates and troubles design through axes of gender [75, 79], ethico-political care [77, 78], sustainability [76, 103], the anthropocene [80], and collaborative more-than-human future making [6]. Dr. Shana Agid is an artist, design researcher, activist, and Dean of the School of Art, Media and Technology at the Parsons School of Design whose work engages design and participation [4] across dimensions of care [1] ethics [3] politics [2] and geography and infrastructure via queer experience [9]. Dr. Holly Robbins, a postdoctoral researcher in the Department of Industrial Design at the Eindhoven University of Technology, explores posthuman design for transitions to renewable energies [93]. Dr. Tammy Shel is a feminist philosopher and care ethicists who uses care ethics to advance pedagogical methods and theory [99, 100]. Michael Beach, a PhD student and researcher in the College of Engineering at the University of Washington, has facilitated research on the UX of climate change [21], and has used posthumanist theory to facilitate and design a collection of design fictions

or multispecies care and collaborative survival [22]. Dr. Anuradha Venugopal Reddy, a postdoctoral design researcher in the School of Arts and Communication at Malmö University, explores technological interventions such as AI and CA's from a non-human perspective to reimagine more-than-human approaches to ethics [87] and agency [92]. Dr. Ron Wakkary is a design researcher in the School of Interactive Arts and Technology at Simon Fraser University and the Chair of Design for More Than Human-Centered Worlds at Eindhoven University of Technology. His work explores thing-centered design [120, 122, 123], posthumanist reconsiderations of design epistemology [117], and how posthumanist design (informed by care theory) might decenter humans to enable multiple and diverse worlds [118, 121], as well as sustainability in design more specifically [119]. Neilly Herrera Tan is a PhD student and researcher in the College of Engineering at the University of Washington who uses speculative design to investigate relationships with power and privacy via smart home cameras [108].

Workshop 2

Dr. Alex Taylor at the Centre for Human Computer Interaction Design, at City, University of London is an researcher who has used feminist new materialist relational ontologies to de-center human for alternative food futures [65], to explore re-orientations to design which expand human / non-human relations [109], and feminist care theory to challenge AI and Assistive Technology [26]. Dr. Tyler Fox, an artist and researcher in the Department of Human Centered Design & Engineering at the University of Washington, uses posthumanism, relational ontology, technology, and integrated non-humans as part of an art practice which creates shared experience between humans and nonhumans highlighting their relations [51]. Dr. Austin Toombs is an HCI researcher at Purdue University who has argued for the integration of a feminist care ethics perspective in HCI to attend to and problematize care entanglements with researcher relationships [115], technology mediated community spaces [113], gendered labour division [20], and gig economy labor practices and technologies [114]. Armi Behzad, a Ph.D. student and design researcher at the School of Interactive Arts and Technology at Simon Fraser University is interested in human-technology relations [121]. Dr. Audrey Desjardins, a design researcher in the School of Art + Art History + Design at the University of Washington, uses feminist methods to reimagine everyday encounters with things [41], explores human-data relationships as having an agentic materiality [39, 42], and to deeply investigate the role of designer and thing as co-constituting and co-configured [43]. Cassidy is a creative technologist and researcher at a UK university where they use intersectional feminism and queer studies to ground explorations in self-care technologies. Gabrielle Benabdallah is a PhD student, artist, and researcher in the department of Human Centered Design and Engineering at the University of Washington who explores the relationships between humans, technology, language, and creativity. Dr. Cally Gatehouse is a feminist designer and researcher in the School of Design at Northumbria University with an interest in distinctive kinds of knowledge design can produce and how that can help designers, researchers and citizens to navigate and understand a world shaped by network technology [53, 54, 56].