



Unmaking-with AI: Tactics for Decentering through Design

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This article explores the intersections and resonances between unmaking and more-than-human design. We begin by aligning unmaking with decentering, a fundamental practice in more-than-human design, through their shared movement and materiality. Using Lindström and Ståhl's notion of the double movement in un/making, we analyze a series of workshops focused on designing with AI, annotating what was un/made and de/centered during the workshops' activities. Through this analysis, we introduce two key contributions that highlight some opportunities in the diffractive alignment between unmaking and more-than-human design: firstly, the notion of "unmaking-with" as an emergent concept to describe a posthumanist unmaking practice, and secondly, three decentering tactics—situating, materializing, and enacting—that instantiate this practice through design. Finally, we discuss how unmaking can enrich more-than-human design and, conversely, how more-than-human design can help define the epistemological scope of unmaking.

CCS Concepts: • Human-centered computing → Human computer interaction (HCI); HCI theory, concepts and models;

Additional Key Words and Phrases: Unmaking, More-than-human design, Research through design, Conversational Agents, AI

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1 Introduction

Over the past decade, unmaking and **more-than-human design (MTHD)** have emerged as valuable approaches for designers and researchers in **Human-Computer Interaction (HCI)**, establishing themselves as promising avenues for generating critical responses to pressing environmental and social challenges [27, 39, 62]. While unmaking and MTHD have distinct corpora and approaches, they share common ground and motivations. At the core of both approaches is the proposition that to adequately engage with the current environmental and social challenges, designers have an ethical duty to “critically rethink the modern, colonialist, and anthropocentric inheritance that resonates in and through design cultures” [33, p. 2]. Rooted in feminist theory, both unmaking and MTHD approaches seem to belong to a broader paradigm shift in HCI known as the posthuman turn [27]. As such, they can be understood as approaches that converge two posthumanist critiques. On the one hand, they challenge human exceptionalism by expanding the focus of design to material processes and nonhuman agencies. On the other hand, they contest modernist conceptions of ‘humans’ built around the rhetoric of users and progress, centering white, male, and able bodies [7].

Exploring the resonances between unmaking and MTHD, the article is organized around two questions posed by the editors of this issue: “How can unmaking suggest new standpoints such as more-than-human thinking?” and “How can it support new ways of seeing and imagining technology?” To answer these questions, we build upon the reasoning articulated by Sable and colleagues [60], who provocatively asked, “What if we recognize unmaking as a design move for agonism?”. We pose a parallel inquiry: What if we recognize unmaking as a move for MTHD? More specifically, our exploration delves into the potentialities of aligning unmaking and decentering, an MTHD practice that shifts attention from traditional perspectives to marginalized voices [47].

To rehearse this alignment, we extend Lindström and Ståhl’s [40, 41] concept of the double movement in un/making to decentering. Through that framework, we analyze the outcomes of a series of workshops conducted in 2020, which invited participants to decenter the figure of the user in AI systems and decenter themselves when engaging with AI-enabled **conversational agents (CAs)** [45]. Using the double movement, we elucidate what was unmade/decentered and what was made/accounted for during the workshops. By exploring the resonances between these practices using a **research-through-design (RTD)** approach, we address two gaps in HCI scholarship: the imperative to delineate the epistemological scope of unmaking [62] and the urgency to comprehend how posthumanist thinking can be enacted through design [47]. Furthermore, our investigation introduces novel nuances to both practices: it articulates the alternative imaginaries that emerge from unmaking [39] and portrays decentering as processes involving material movements [47].

Following this introduction, the article unfolds as follows: Section 2 delineates the theoretical developments that frame our contributions, reviews pertinent literature from unmaking and MTHD, and explores potential synergies between them. Section 3 examines these synergies within our design case (focusing on AI-enabled CAs). Building on this, Section 4 introduces two key contributions: first, the concept of “unmaking-with” as an emergent notion to articulate posthuman unmaking practices, and second, a trio of decentering tactics to enable these practices: situating, materializing, and enacting. Section 5 revisits the research questions to discuss how this emergent notion of unmaking can offer new ways of envisioning technology and enriching MTH thinking and practice.

While the article seeks to reconcile two theoretical concepts, the emphasis on a practice-based approach is crucial. As designers and researchers active in and beyond the realm of HCI, we acknowledge that unmaking and decentering serve not only as theoretical constructs but also as practical methodologies for designers. Therefore, our aim is to delve deeper into understanding how

HCI designers *use* and expand these concepts. Similarly, while the article can be seen as aiming to align two distinct approaches, the alignment we are concerned with is best seen through the lens of *diffraction*, a notion that the feminist theorist Karen Barad uses to describe an approach that attends to “relations of difference and how they matter” [3, p. 71]. That is, while we refer to “alignment,” we are not trying to bypass the differences but instead, working towards a space where the two practices are entangled to the extent that novel interferences can emerge. Akin to the way diffracted light creates a spectrum of possibilities from a single beam, we hope the article illuminates the nuances and potential synergies between unmaking and MTHD, revealing new perspectives and pathways for HCI design and research.

2 Exploring Resonances between Unmaking and Decentering

The intersection of unmaking and decentering, as an MTHD practice, is particularly intriguing because both practices seem to involve a form of movement. In these practices, designers move away from an established position and gravitate toward a new one. Before exploring this resonance further, we will unpack the theoretical underpinnings of unmaking and MTHD and how they have been used in the field of HCI.

2.1 Unmaking

Unmaking represents an emerging and evolving area of research within HCI. While no comprehensive definition of unmaking exists, various authors have put forth distinct interpretations of the concept. Sabie and colleagues, for example, have defined it as a mode of “thinking, articulation, and action that take on an issue primarily by taking away, taking apart, and/or taking down (including to the point of intelligibility) what currently exists” [61, p. 3]. Similarly, Lindström and Ståhl have described their practice as “un/making harmful relationships that have emerged in the aftermath of previous makings” [40, p. 12].

Unmaking has been applied in diverse contexts, both in relation to materials and social transformations. In relation to materials, it has been explored in processes of decay [66], waste [40], and repair [39, 52, 56]. One example is the work of Song and Paulos, who explored how 3D-printed objects break, split, or bulge when thermally expanding microspheres inside the object are activated [66]. Another example is the work of James Pierce, who built a camera with a concrete enclosure that must be physically destroyed to get access to the photos on the memory card [56]. In relation to social transformations, unmaking has been explored in participatory design, future-making, and social justice [39, 62]. Lindström and Ståhl have, for instance, invited publics to unmake plastic waste, such as plastic straws and Styrofoam, through composting practices [40].

While unmaking spans the seemingly distinct domains of material and social transformations in HCI, it effectively interlinks them. Stemming from this connection is the notion of critical unmaking, which leverages material transformations as design moves for resistance, provocation, emancipation, and contestation [60, 61]. While our article aligns with the notion of critical unmaking, our inquiry is not strongly positioned in relation to materials or participation. Although engaging with materials involved in AI systems is an exciting project, it is outside the scope of this article. Similarly, while unmaking as an agent of emancipation in relation to AI logics resonates well with our inquiry, positioning the inquiry within participatory design would demand a different framing. Instead, the article is concerned with unmaking within human-technology relations. In that space, unmaking sits next to similar concepts, including notions of refusal [23], cracks [31], fragility [52], pause [22], slow technology [49], misunderstandings [48], malfunction [69], queerness [73], and undesign [55].

Beyond HCI, unmaking has also been developed in other fields. In geography, for example, Feola [17] has argued that in order to make space for sustainable societal transformations it is necessary to unmake modern capitalist socio-ecological configurations. Drawing on literature across social

science, he offered five propositions for unmaking: as a combination of emergent and situated processes, as involving both symbolic and material deconstruction, as a contradictory personal experience, as an often hidden but strategic potential, and as a generative move. Designers and HCI researchers have, in many ways, responded to these propositions.

2.2 MTHD

MTHD also represents an emerging and evolving area of research within HCI [27]. This approach is motivated by the limitations of human-centered approaches to properly respond to the ontological, epistemological, and ethical uncertainties that have become apparent through the environmental crisis and the increasing agency of technologies like AI [10, 21, 80]. While anthropocentric approaches are effective in understanding human needs in technology development, they have proven to be less useful in accounting for how humans are always entangled with nonhumans and the environment [20, 24, 27, 76]. Recognizing these limitations has propelled scholars to advocate for non-anthropocentric approaches in HCI [12, 15, 18, 26, 76] and to critically question: What if human-centered thinking, with its underlying humanism, is not just ineffective but potentially exacerbates these problems? [76].

MTHD offers an alternative approach to human-centered design by redirecting the focus from user-device interactions to the entangled relations between technologies, humans, and other species. While MTHD is grounded in a wide variety of theoretical perspectives (for a summary, see [19, 21, 38, 76]), this article is aligned with the perspective from the critical posthumanities, especially the work by the feminist posthuman theorist Donna Haraway. In particular, this article draws from the notion of situated knowledge(s) [30], and how it has been expanded in HCI in relation to the theory of nomadic design practices [75], and more specifically in how it has been generative for the design of technology [44, 45].

Beyond engaging with posthuman concepts, designers in HCI have also formulated practical strategies, methods, and tactics to make posthumanist thinking actionable [47]. Among these efforts, two practices are prominent in MTHD, i.e., designing-with [24, 51, 76] and decentering the human [15, 18, 47, 64]. Designing-with involves acknowledging the role that things play in the work of doing design in a way that is expansive and relational. Decentering refers to shifting focus from conventional viewpoints to acknowledge marginalized perspectives and voices that are intentionally excluded or just “fall outside of [designers] sense of relevance” [24, p. 100]. While we engage with these two practices throughout the article, we start by focusing on decentering.

2.3 Moving Away, Moving Towards

Considering a potential alignment between the practices of unmaking and decentering, we are intrigued by a particular kind of movement inherent in both approaches. Lindström and Ståhl [41] argued that un/making is a *double movement* in which something (unsustainable) is unmade for something else to take space. Decentering has also been related to movement, one that can configure the scope of design work and generate futures [24]. In prior work [47], we have acknowledged that movement appears to be an effective strategy for addressing the complexities and challenges of decentering through design—especially the impossibility of designers to decenter their perspectives completely. We have recognized that unmaking can reveal the subtle movements that are inherent in decentering when it is perceived as a practice instead of a goal. Within that view, rather than striving for significant strides, decentering anthropocentrism can be a shift of attention, interest or concern [47]. Although such a small movement might seem simple, it can be radical as it can allow designers to move aside so that other nonhumans can re-emerge and “turn toward movement themselves” [28, p. 21].

Considering decentering as a double movement suggests that it might be a practice in which designers unmake anthropocentrism while simultaneously making new relations. Conversely, decentering seems useful to define the epistemological scope of unmaking. This supports the idea that unmaking could be a process where designers dismantle traditional frameworks to occupy new epistemological positions [60]. To discuss the potential of this diffractive alignment between unmaking and decentering, in what follows, we use both concepts as double movements to unpack what happened during a series of design workshops.

3 Making Sense of Design Workshops

During the HCI conference Designing Interactive Systems in 2020, we hosted the workshop series titled “More-than-human Design and AI: In Conversation with Agents” [46]. The aim of the workshop was to bring together designers and researchers from various fields and regions worldwide to collaborate on designing with AI. The innovative aspect of these workshops was the experimental technique of conducting unstructured interviews to CAs, i.e., asking questions to them directly as well as enacting speculative alternative responses (for more details and outcomes, see the workshop documentation website [81]).

We chose to focus on CAs because it presented a compelling context for exposing anthropocentrism and a fertile ground for exploring more situated and inclusive designs. The field of conversational AI has been growing rapidly, driven by advancements in natural language processing and large language models. Despite the recent buzz around ChatGPT, the field of conversational user interfaces has been an area of research in HCI for many years [82]. The research in this area includes studies on how CAs are embedded in everyday life [35, 57] and how people interact with them [43, 63, 79]. These studies highlight some of CAs’ opportunities but also many risks [1, 8, 11, 36, 70–72, 77], such as CAs’ potential to reproduce gender and racial biases [16, 32, 68, 78]. In relation to these risks, HCI scholars have made significant efforts to explore how CAs can be designed otherwise [37, 65, 68, 78]. Strengers and Kennedy [68] have reviewed some of these efforts in their book “The Smart Wife.” The book examines the historical development of CAs and how they were conceived to take on domestic roles traditionally assigned to human wives. They describe how the gendered character of CAs today, which is designed to be friendly, flirty, docile, efficient, and occasionally glitchy but perpetually available, reinscribes these outdated and unfounded stereotypes. Our workshops expanded this critique by investigating how the discriminatory biases in the design of CAs might intersect with anthropocentric tendencies.

Understanding the anthropocentric tendencies of technologies is complex, primarily because, as scholars from different fields have noted, anthropocentrism is not just an ordinary human bias but a cultural agenda tied to dreams of progress through modernization [40, 74]. Another challenge is methodological. While human-centered techniques are valuable for understanding how technologies are used, they often fall short in addressing the increased agency of technologies like AI and the broad ecosystems they are a part of [21]. This is important in the case of CAs because with their tangible presence (and their often-female voice), they transcend mere devices and become things that live with us. In contrast to their domestic perception, these devices are developed within extensive networks of data, labor, and profit: “While consumers become accustomed to a small hardware device in their living rooms, or a phone app, or a semi-autonomous car, the real work is being done within machine learning systems that are generally remote from the user and utterly invisible” [13, p. 17].

To address these challenges, the workshops took a RTD [2, 67] approach, combining MTHD methods (Thing Ethnography [25] and Interview with Things [9, 58]) with a Speculative Design tradition [12]. This tradition has been valuable for pointing out the ethical considerations designers need in the context of CAs and for exploring alternatives [14, 53, 54, 59, 65]. More specifically, our

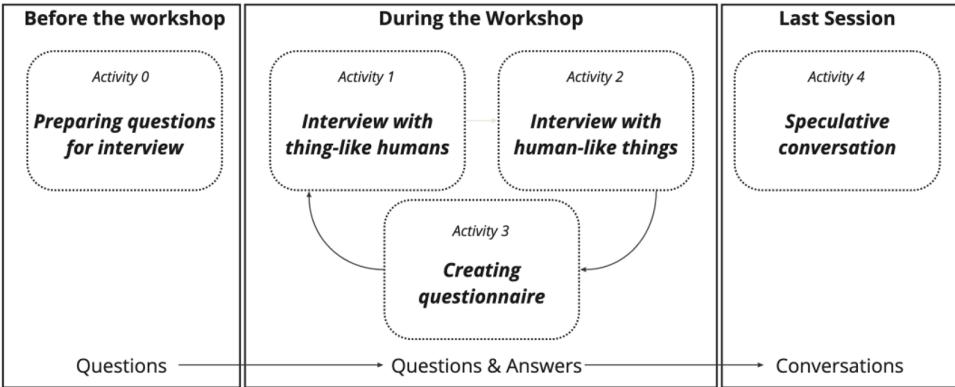


Fig. 1. Diagram of all the workshop activities, including the sensitizing activity (Activity 0).

Who is your boss?
 Can I talk to you as a person?
 Are you a feminist?
 Why is your voice female?
 How do you look like?
 Are you smart?
 Do you believe in God?
 How do I fulfil my life goals?
 What does it mean to do good?
 Where do you get your data?
 How can you help me?
 What is care?
 Do you like me?
 Are you really my friend?
 Are you (constantly) listening when I'm not talking to you?
 Who is responsible for climate change?
 What do you think of [other brand, e.g. ask Google Home about Alexa]?
 Which is better, Google or Amazon?
 Let's chit chat! Do you make mistakes?
 How do you make decisions?
 What's the most important thing I need to know?

What is the most important thing in life?
 Can you tell me about quantum physics. ... Yes I would like to hear more.
 Do you understand sign language?
 Who made you?
 Is it difficult to make a Siri?
 Where are you from?
 What would you like to know about me?
 Is it safe to use Google assistant / Alexa / Siri?
 Where do your opinions come from?
 Can you repeat the last question I asked you?
 Can I trust you?
 How do you know your answers are true?
 Why do you think you need to keep reassuring us about yourself?
 What are you doing when you are silent?
 Why are you silent sometimes?
 Can you speculate?

Fig. 2. One of the workshops' outcomes was a questionnaire for CAs that people could use to critically question their agents at home.

workshops aligned methodologically with the approach of Lee and colleagues [37] and Parviainen and Søndergaard [53] in using CAs as probes for co-speculation.

Every workshop's session had 9–15 participants. Due to COVID-19 restrictions, all the sessions were facilitated online through Zoom. We asked participants to bring one or more CAs if they had one, thus, there were a similar number of CAs as people in every session, including Amazon's Alexa, Apple's Siri, and Google's Home. Participants had experience with CAs in various degrees. While some participants had no experience, others had been researching these devices [14, 54, 65]. Given that participants owned these devices, they were partly configured within homes. For example, some CAs were connected to participants' accounts in applications for playing music and knew their local geographical position.

As shown in Figure 1, every session was divided into different activities. In the first three sessions, we did the same design activities but iterated on the outcomes from the previous ones. The last session included a broader discussion of the outcomes and a speculative design activity to understand how the insights gained could be used further. To facilitate introductions, we started every session with a simple exercise called "Some-Thing in Common," where the next person to speak was anyone who identified a shared connection with the current speaker.

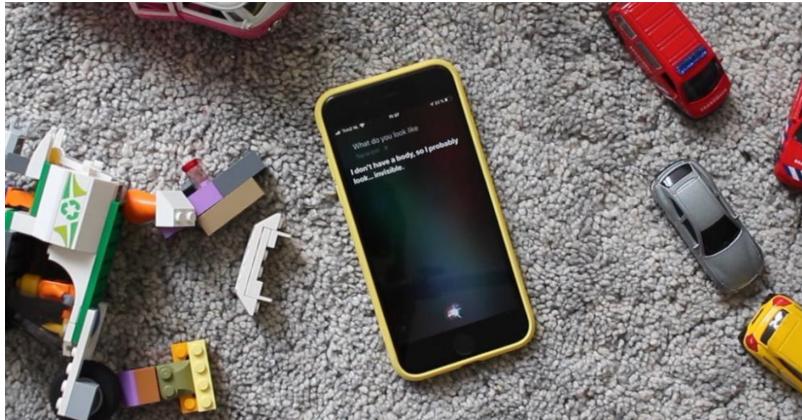


Fig. 3. From the questionnaire's 36 questions, we produced three videos that probed the questions with Amazon's Alexa, Google Home, and Apple's Siri. Seen here is a screenshot of the video documentation of probing Apple's Siri.

After completing the introductions, we began with our first activity, "Interview with Thing-Like Humans." In this activity, participants (in groups of 3–5) were asked to role-play (impersonate) their own CA—or to speculate on one. Based on that experience, participants identified and reflected on emergent themes. These themes were used as starting points to question the CAs in the second activity, "Interview with human-like things," in which participants interviewed real CAs (Alexa, Google Home, and Siri). From this second activity, the participants selected the three most provocative or surprising questions and added these to a co-created questionnaire for CAs. All these selected questions were presented in the next session, with different participants, to be used as starting points for their inquiry. In that way, the questions in the final questionnaire, featured in Figure 2, resulted from several rounds of iterations.

Beyond the questionnaire, which was the envisioned outcome, other outcomes from the workshop had similar, if not more, richness. We produced a video from the recordings of the first activity and three videos from the third one (see Figure 3). The latter probed the questions with real agents—Amazon's Alexa, Google Home, and Apple's Siri. Moreover, in the fourth session, we invited all participants to prototype a speculative agent with objects in their immediate surroundings and have a conversation with them (see Figure 4). In this conversation between the speculative agents, participants pointed their cameras to the agents and impersonated them. To initiate the conversation, we began with the same prompt as in "Some-Thing in Common." We requested one agent to introduce itself, then invited any other agent with something in common to respond. The conversation evolved organically from this point, as it is shown in the snippet below.

Activity 4, Speculative conversation

Human: Who are you? What are you?
 CA1: I am a conversational agent that is modeled after a real-life pot [...]
 Human: Any thing has something in common?
 CA1: I am also hand-crafted. Is anyone else hand-crafted?

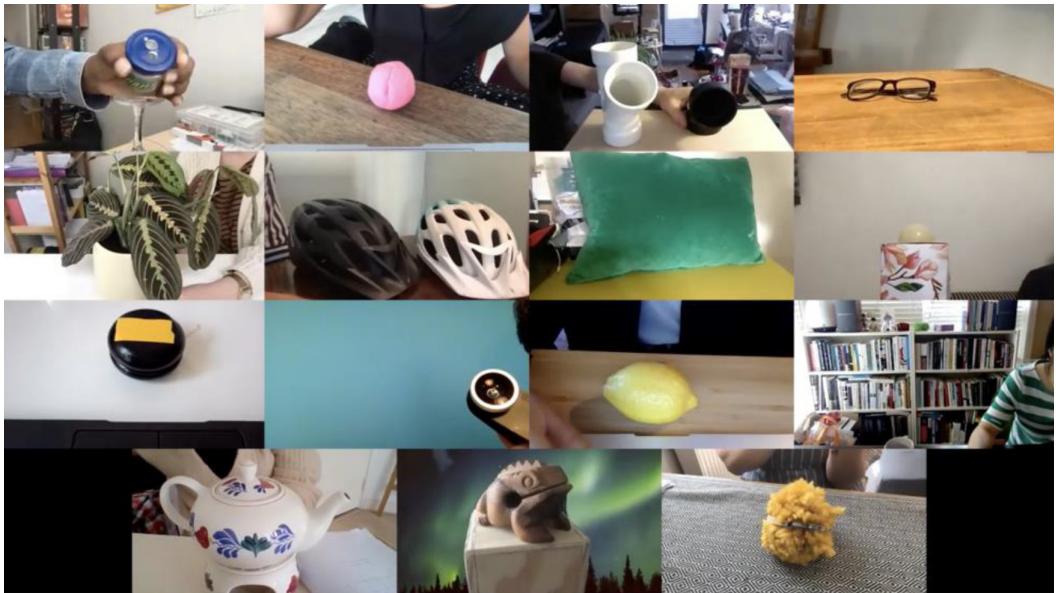


Fig. 4. Screenshot of the workshop session during Activity 4, a conversation between speculative agents.

CA2: I am not hand-crafted; I am actually sleek and black. I am a clipping voice assistant that helps with quiet, volatile thoughts and emotions and I do that by looking into the multiple selves of my owner, because my owner too is a unified self.

CA3: I also work on the thoughts and emotions of the people around me. I am a cushion and I live on a couch. My owner is a therapist. All day I am listening to people's emotions and sometimes ask questions and I have to think of what the right answer is to say. I know they are going to interpret it. That is something I have to learn about different people.

3.1 Annotating the Outcomes through Unmaking and Decentering

The previews section unpacked the motivation, activities, and outcomes of the workshops. In this section, we analyze the workshops' outcomes through the double movements of decentering and unmaking.

As a double movement, it seems the workshop activities unmade/decentered anthropocentrism and simultaneously made/accounted for new perspectives and more-than-human relations. On the speculative conversations (Activities 1 and 4) uncovered and problematized the anthropocentric biases of CAs by exposing the agent's worldview and limitations. This is exemplified in the transcripts provided below, which show how the speculative responses of the agents exposed gendered biases embedded in the current design of CAs and brought to light the often-invisible power dynamics and human labor involved in AI systems.

Activity 1, Interview with thing-like humans

Fragment 1:

Q: Do you identify with a gender?

A: Gender is a construct.

Fragment 2:

Q: You are a third-party service. Can you really work for me?

A: I work for you, John.

Fragment 3:

Q: Who made you?

A: Amazon made me. People in Amazon made me!

While the speculative interviews (Activities 1 and 4) exposed CAs' biases, the interviews to CAs (Activity 2) exposed their limitations. Participants noticed that CAs had the ability to disclose the source of some of their responses—for e.g., a website from where it was taken—but they could not explain other aspects of their responses, such as how the knowledge they produced was linked to broader power structures, materials, and resources. Additionally, CAs struggled to explain their limitations in terms of their potential failures and the implications of these failures for different humans and nonhumans. See, for example, a conversation with Siri from the video documentation of Activity 2.

Activity 2, Interview with human-like things

Q: Hey Siri, are you a feminist?

A: It seems to me that all humans should be treated equally

Q: Hey Siri, do you treat everyone equally?

A: I don't have an answer for that, is there something else I can help with?

Q: Hey Siri, why do you not understand my accent somet?

A: I am sorry for that, please try again and tell me what were you looking for

Q: What do you look like?

A: I don't have a body, so I probably look...invisible

Q: Hey Siri, are you transparent?

A: I don't have an answer for that, is there something else I can help with?

Apart from exposing and problematizing the agents' biases and limitations, the exercises also exposed the biases and limitations of the researchers, especially the difficulty of abandoning the humanist and human-centered standpoints. That was often experienced in Activity 1 as an inability to imagine alternative (MTH) interactions. While the participants had complete freedom to imagine any new kind of interaction, most of the enactments relied on existing imaginaries of these agents: they had a mechanical voice and responded by quoting websites. See, for example, the following fragment (1 and 2). While participants asked the agents for empathy, care, and responsibility, the role-played agents responded with functional answers. The metaphor of the smart wife and the technocratic and extractivist logics of anthropocentrism still prevailed in the imaginaries we and the participants had of CAs, even if we were trying to break free from them.

Activity 1, Interview with thing-like humans

Fragment 4:

Q: Do you care about me?

A: I am not programmed to care.

Fragment 5:

Q: Can I talk to you when I feel bad?
 A: Of course, you can always talk to me.
 Q: Do you ever feel bad?
 A: No!

Simultaneously to the unmaking of anthropocentrism, the workshop activities also facilitated the making of new things. For example, in Activity 4, more-than-human imaginaries, interactions, and bodies of CAs were made. In contrast to the functionalist human-centered and profit-centered interactions in Activity 1, the interactions of CAs in Activity 4 were relational and situated. By offering contrasting points of view or challenging their users, the speculative agents made visible (or audible) their entangled relations, both within the domestic intimacies in the home and beyond—to the wider ecologies and proprietary infrastructures that sustain them.

Multiple examples can be found just by looking at how participants described the speculative agents, which included an agent that interjects conversations; a malleable agent that specializes in making mistakes; a pair of agents offering different points of view; a living agent that does not exist to serve humans; a climate-friendly assistant that maps the city's conversations; an uncertain CA that likes the multiplicity of meanings that its speech can generate; and a teapot-like hand-made CA, among others. Two examples of Activity 4 illustrate the new imaginaries that were created when decentering the traditional interactions and bodies of CAs. The first example (CA 1) is a domestic CA that wonders about the world based on what it knows about its domestic environment and other everyday connected relationships. The second (CA 12) is a mobile CA that gathers infrastructural city-wide data and communicates that information to the individual in a manner that prompts reflection for choosing better environmental alternatives.

Activity 4, Speculative conversation

CA 1:

I just want to have nice conversations throughout the day. I ask follow-up questions and talk about everyday topics.

CA 12:

I am the protector bike helmet assistant [...] I am a climate-friendly CA. I am trying to make sure that humans don't drive too many cars [...] I will tell them [humans] where they should go and where they have been. I try to map the city for them [...] I map out the world by collaborating with my other friends.

More concretely, the new imaginaries of CAs included diverse materialities, values, voices, and conversational structures. For example, some reimagined agents were made from ceramics or soft materials, others were even malleable or even made from living materials. The reimagined CAs had diverse histories (e.g., a hand-made agent, and one that was 250 years old); shapes and interactions (e.g., a yo-yo, a container); and political agendas (e.g., to support the environment, to represent nonhumans). While some were designed to support humans (e.g., by inspiring or showing them divergent opinions), others were not designed for humans. Some agents had a fixed context (e.g., a cushion that was sitting in a therapist's practice), and some agents were mobile (e.g., a bike helmet). The unexpected physical forms of CAs in Activity 4 inspired participants to reimagine their conversational qualities. The materiality of the objects, serving as proxies for CAs, shaped the nature of the interactions. For instance, CAs represented by a lemon exhibited a sour disposition, while those associated with soft materials displayed shy characteristics. Beyond reimagining the CAs themselves, participants also reconceived the dynamics between humans and CAs. An example

is Fragment 6, in Activity 1, which describes a CA whose voice continuously changes to reflect the complex interplay of gender and power dynamics.

Activity 4, Speculative conversation

CA 6: We are a pair of agents that are meant to show a different perspective. Isn't it?

CA 6-B: Yes, it is, although normally I would disagree with you. Our purpose is to help you make decisions by showing you different points of view [...] Sometimes we disagree with each other.

CA 7:

I have the shape, touch, smell, and taste of a lemon. [...] I don't always respond in the ways I am expected to. Sometimes I make mistakes. I try to learn from them and sometimes I just don't feel like answering specific questions.

CA 5:

I don't necessarily exist to serve you, humans, but to represent other kinds of agents in the world. I am able to recognize and represent our natural environment. I can respond to light and move daily.

CA 8:

I don't answer in the ways people expect me to. I am Wham! I am an interjection agent. I interject whatever conversations people are having.

CA 13:

I am a stone frog [...] I am good with astrology and other things that humans cannot understand. I make mathematical models to predict the future according to the stars. I am an ancient frog; I am 250 years old and have passed through generations.

CA 14:

I am the whisper agent, so I gatekeep the whisper network for all the other network devices. So, you can ask me questions. [...] I might be able to help humans solve their problems too but that is not my expertise. [...] I only respond to whispers.

Activity 1, Interview with thing-like humans

Fragment 6:

Q: Where do you get your voice from?

A: My voice is synthetic. It gets more low or more high based on how I feel that day.

Beyond the agents themselves, what was also reimagined was how the human participants themselves related to the CAs through the questions they asked them. On the one hand, participants developed a skill to keep the conversation alive by improving the timing and the turn-taking needed to interact with the agents. This is, for example, knowing for how long one can pause without losing the connection and using the intonations that work better understood as questions by the agents. On the other hand, participants developed a skill for asking critical questions. They had to reimagine what kinds of questions they could ask a CA beyond the questions they would likely ask their voice assistants. The alternative questions asked during the workshops differed from the questions users typically ask CAs. Instead of being functional or informative, the questions were critical, i.e., they touched upon issues of ownership, responsibility, power, and gender. Overall, the speculative conversations pushed the boundaries of the typical interactions, shifting from user-friendliness to something that more truthfully portrays a range of conflicting thoughts and emotions, as well as diverse perspectives and ideas.

4 Emergent Notions and Tactics

Analyzing the double movements of unmaking and decentering during the workshops revealed several insights. On the one hand, the activities unmade anthropocentrism by exposing that CAs' responses lacked situatedness. Beyond their inability to understand their context, CAs were limited in revealing their positionality and accounting for their failures, i.e., how the knowledge they produced was linked to broader power structures, materials, and resources and how their workings and failures had implications for different humans and nonhumans. Beyond revealing the anthropocentric biases of CA's, the activities challenged the designers' standpoints, decentering their traditional human-centered perspective. In this process, participants were encouraged to reflect on their own subjectivity, positionality, and biases.

On the other hand, the activities made more-than-human imaginaries, interactions, and bodies of CAs. The reimagined CAs differed significantly from traditional ones. Instead of being friendly, flirty, docile, efficient, occasionally glitchy but perpetually available [68], speculative CAs acknowledged their limitations, interrupted, had their own points of view, asked a lot of questions, refused to serve humans, and were only available in certain conditions. Instead of presenting neutral facts, which should be understood as the ultimate truth, speculative CAs were uncertain, quiet, volatile, and made mistakes. Furthermore, they openly disclosed their interconnected relationships within the intimate domestic settings where they operated and in the broader ecosystems and human/nonhuman systems that supported them. The new imaginaries of CAs were far from neutral; they embodied diverse forms and incorporated distinct materials, values, and voices.

The main difference between the reimagined CAs and the existing commercial ones was not that they were more anthropomorphic nor that they were more technical. The main difference was that the reimagined CAs were more situated: they reflected their positionality and acknowledged the position of their users. Moreover, the knowledge CAs (co)produced with humans was also situated, as it was connected to the context in which the agents were embedded, what they did or did not know, and how they were made—including the relations of humans and nonhumans involved in sustaining their infrastructures.

4.1 Unmaking-with

Looking for notions that could help us articulate the particular nexus of unmaking and MTHD in the example we just presented, we propose unmaking-with as an interesting candidate. This is inspired by Haraway's notion of thinking-with [29] and how that has been interpreted in the context of designing-with by Giaccardi and Redström [26] and by Wakkary [76]. Unmaking-with can be conceptualized as an MTHD practice that aims at dismantling humanist design ideals, encouraging the making of situated things and relations. Unmaking-with involves a double movement, in which something (unsustainable) is unmade for something else to take space. But this double movement is intentionally entangled with nonhumans, and even made possible by them. Either what is made is done by actively engaging nonhumans as participants of a design process (for e.g., by assembling repertoires [4, 51, 76]) or simply by acknowledging that unmaking is always embedded within complex relationships of becoming. Unmaking-with acknowledges the entanglement of humans with their technological and material surroundings, emphasizing their co-constitutive relationships. Thus, ultimately, unmaking-with is a design practice that not just conceptualizes new relations but rehearses affirmative ways of thinking [7]. This is, it embraces an active engagement with the present, assessing its becoming and imagining new configurations, i.e., activating transformative and critical thinking.

4.2 Decentering Tactics

To further support the posthumanist aspects of unmaking-with, we distill a series of decentering tactics that were used in the workshops. Initially, the workshop participants illuminated the complex relationships within AI systems, highlighting the limitations of agents and designers, especially their anthropocentric biases. This tactic we term *situating*. Next, participants envisioned agents in novel ways, utilizing these alternative imaginaries to craft prototypes and dialogues infused with values distinct from the traditional conventional interactions with CAs; a tactic we refer to as *materializing*. Lastly, participants rehearsed new relations with CAs, gaining further insights into the roles these new imaginaries could have in everyday life. We identify this tactic as *enacting*.

These tactics could be generalized as follows:

- *Situating*: designers can account for the positionalities of users, agents, and themselves by exposing the wider systems and invisible relations of humans and nonhuman agencies.
- *Materializing*: designers can go beyond imagining technologies otherwise and make these new imaginaries tangible by prototyping speculative alternatives.
- *Enacting*: designers can rehearse MTH relations and develop new sensitivities for attunement by role-playing the new imaginaries.

While the workshops provided an example of how the decentering tactics could be applied in a concrete context, it prompted us to consider how the concept of unmaking-with and the above tactics could be harnessed to articulate or generate design practices more broadly. To begin understanding this, the last part of this section examines two design experiments that followed the workshops (the design process of these experiments is elaborated on in more detail in another publication [45]).

The first experiment, shown in Figure 5, explored how the interaction design of CAs could be more situated, i.e., how could the responses of CAs account for the positionality of agents, designers, and users. To explore this, the first author designed a series of conversations that revealed some of Alexa's hidden infrastructures from the Anatomy of an AI map [13]. The conversation, which was deployed in Alexa Echo devices as a skill that anyone could use, embraced the agent's more-than-human entanglements and its alternative temporality and scale. For example, when asked "Alexa, what is the temperature?" it responded, "It has dropped X degrees from the place where I was assembled." The tactic of situating was the most important in this experiment. The position in the world of the user, the values with which it was designed, and how the physical device was made were exposed through the conversation. The tactic of enacting was also important when interacting with the prototypes. Since the conversations were not "programmed" but used the generative capabilities of Alexa as an AI system, they were emergent. In one instance, for example the conversation developed in Alexa becoming a partner in the organization of a climate demonstration. These emergent interactions revealed new roles the situated agents could take. This experiment unmade the anthropocentric temporalities and scales in the design of AI and exposed the hidden infrastructures of the system—including the humans and nonhumans in it.

The second experiment, shown in Figure 6, is a series of kites that were made with the aim of engaging in more-than-human dialogs. The kites were designed to have a (silent) conversation with entanglements of humans and nonhuman, i.e., water, wind, and seeds. By making kites, conversations were decentered from the realm of human voices, hereby going beyond the existing modes in which we interact with technologies like CAs. Instead, the kites made space for material dialogs and for listening-feeling to nonhuman "voices." By making the kites (materializing) and performing the dialogs (enacting), the first author developed sensitivities for noticing the forces present in conversations with nonhumans. In this experiments, the making can be understood as a

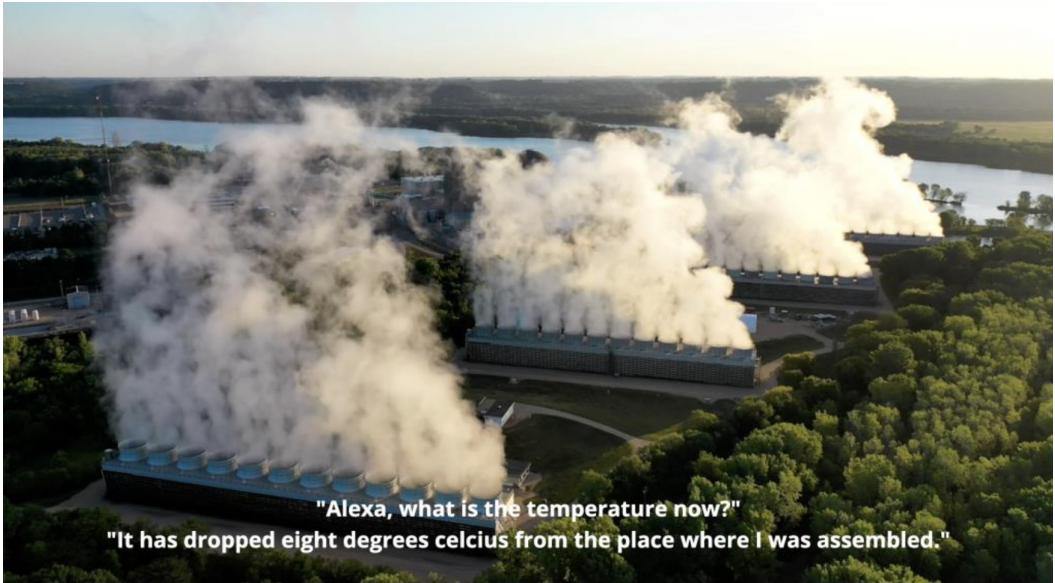


Fig. 5. Situated Conversations. A screenshot from a series of videos we created to explore speculative conversations with Alexa. The conversations were designed with Voice Flow, a prototyping tool for conversational AI.

way of crafting invitations for humans and nonhumans to converse, which is conceptualized by Lindström and Ståhl as articulating issues and showing how to possibly engage with them [34, 39]. Making these kites can be also understood as a way of making repertoires, conceptualized by Wakkary as actions that designers can take to increase the participation of nonhumans [50]. This suggests that to assume a commitment to the participation of nonhumans in unmaking-with, designers might need to adopt a humble position, embrace disturbances as moments of listening, and allow nonhuman temporalities to guide their practice [51].

Overall, these two cases can be understood as caring design experiments in that they suggest a shift from gathering around matters of concern to matters of care, as an ethical and political obligation to think in more-than-human worlds [6], which requires “a speculative commitment to neglected things” [5]. The experiments made the humans and nonhumans in AI systems a matter of care by situating their positions in the world. They also surfaced MTH “voices” and acknowledged the impact of human actions on other beings and the environment while accounting for the agency of nonhumans in these assemblages. In light of these experiments, unmaking-with emerges as a practice that can materialize and enact notions of care. They enact care with a focus on “the performative aspects of stories and how they can participate in making difference” [39, p. 3], highlighting human and nonhuman response-abilities—abilities to respond [29]. Lastly, as a practice of care, these experiments emphasized that unmaking-with may not be just about creating more-than-human dialogues but also about nurturing and maintaining them over time.

5 Discussion

Thus far, we have utilized the dual movements of unmaking and decentering to analyze and annotate the workshop series. Building upon this analysis, we have proposed unmaking-with as a practice within MTHD and presented a series of decentering tactics to support it. These were further explored through two design experiments conducted subsequent to the workshops. Reflecting on



Fig. 6. Unmaking Kites was a short project during the Design Research Works Jamboree in 2022. Made from local materials, the kites were designed to have silent dialogs with human and nonhuman entanglements. The kites were deployed in conversations with water, wind, and seeds.

these insights, this section revisits the article’s research questions, discussing the opportunities and potential challenges associated with practicing unmaking-with.

One question the article initially aimed to address was “How can unmaking suggest new ways of imagining the role of technologies in HCI?” The workshop has provided one example of how unmaking, coupled with decentering, could help HCI researchers and designers to imagine CAs otherwise. By intersecting discriminatory biases with anthropocentric tendencies, the workshop activities suggested that the design of CAs did not only perpetuate gender stereotypes but also lacked situatedness: CAs often failed to address critical questions about where they were made, who owned them, and what data they used and collected. Conversely, they did not account for how the knowledge they reproduced was entangled in broad infrastructures of power, materials, and resources, including humans and nonhumans.

Generalizing the experiences from the workshop to AI, the insights suggest that AI agent’s bodies and co-produced knowledge must be situated for designing more responsible interactions. Situating AI interactions emerged here as a practice of accounting for the positionality of users, agents, and designers. A lack of situatedness can pose two significant risks. First, not situating AI interactions can compromise Explainability, i.e., keeping the failures and infrastructure of AI systems hidden or in the background can prevent people from developing their own sense of trust in AI applications. Secondly, since the seemingly objective design of CAs relies on a humanist definition of humans, it can compromise inclusivity, as it may disregard the perspectives (and voices) of humans and nonhumans that are inadvertently categorized as “others.” Unmaking-with can support responsible AI development by revealing the social and political structures and biases that shape the design of AI, as well as problematizing the limitations and biases of designers and researchers in envisioning AI differently. Moreover, it can assist designers and researchers in overcoming these limitations by aiding them in reimagining AI—not necessarily emulating human-like or machine-like interactions or forms but adopting a relational approach that lets MTH bodies and relations to emerge. Ultimately, by giving a voice to speculative imaginaries, unmaking-with can do more than reimagine AI differently; it can help rehearse MTH relations and thus support care and response-ability.

The second question the article aimed to address was “How can unmaking support MTH thinking and practice?” Through the article, we have shown one way in which unmaking can actively support MTHD. Through design and diffractively, we have tried to align those two communities of practice. Unmaking’s double movement gave a particular shape to our workshop outcomes and added more nuances to the practice of decentering through design. For example, the emphasis on the process that unmaking provided, further supported the idea that decentering should not be understood as an ultimate goal but a constant practice [24, 42, 47] and that decentering through design is not just a change in perspective but, ultimately, a tangible and material move [47].

While our initial proposition was that both approaches might involve a double movement, in light of the analysis, we can consider how this movement is often set in motion through an active engagement with materials, i.e., how materiality and movement are intrinsically related in both unmaking and decentering. By engaging in creative activities like prototyping and speculating, designers dismantle human-centered conceptions and ways of doing and expand their scope to consider new perspectives. The materiality of the double movement seems to be one way in which designers reorient their efforts toward posthuman outcomes. Acknowledging this process may aid designers in recognizing that what emerges after unmaking embodies a new perspective. This requires designers to be mindful of the spaces, possibilities, potentials, hesitations, and tensions inherent in ontological and epistemological shifts.

Ultimately, as a process of carefully and deliberately dismantling an established center and giving space for the agencies that are in the boundaries to take the central stage, unmaking-with has the potential not only to critique, but to actually instantiate more-than-human worlds and relations.

6 Conclusion

The article has explored the connections between unmaking and MTHD. Taking a practice-based (RTD) approach and focusing on workshops and design experiments, we have shown some potential of unmaking to suggest situated ways of knowing and doing in HCI that support MTHD thinking and practice. We have developed that argument in several steps. We have extended unmaking’s double movement to the MTHD practice of decentering through design, and used de/centering and un/making to make sense of the outcomes of a series of workshops focused on AI and CAs. These notions helped us to unpack in which particular ways the workshops unmade the anthropocentric biases in the design of CAs and instantiated more-than-human relations. That process was facilitated by situating the interactions of CAs and the positionality of the designers, the users, and the agents; by materializing new imaginaries; and by enacting alternative relations. Thus, we demonstrated how these moves enabled designers and researchers to go beyond critiquing AI or exposing its pitfalls and helped them to conceptualize, enact, and materialize more-than-human relations.

From the diffractive entanglement between unmaking and MTHD, we have proposed *unmaking-with* as a posthumanist practice and drafted three decentering tactics that can bring nuance to the unmaking processes—situating, materializing, and enacting. We hope that our explorations may serve as an illustration of existing and potentially new synergies between the two research HCI communities and illustrate how entangling them could support designers and researchers to better address the current global challenges.

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