

RESEARCH ARTICLE

Forum Play as a tool for exploring more-than-human relations in the smart city

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Current discussions in the smart city literature have introduced the concept of the more-than-human, attempting to uphold the needs of human and nonhuman residents. We argue that these justice-based claims require deeper understandings of academic assumptions regarding not only who decides, but also how they decide on these desirable futures. This study therefore explores perspectives of more-than-human relations of academics working with the smart city. Using more-than-human Forum Play as an exploratory research method, we facilitated 3 workshops with $n = 37$ participants including students and researchers knowledgeable on smart cities. We found that participants wrote plays that fell into 2 overarching metanarratives: “I need space!” and “I am here!”. These metanarratives help explain the kinds of agency performed through more-than-human relations in the plays. Forum Play also allowed participants to find generative boundaries between themselves and their characters, where they were unable to fully embody the realities of that character. We discuss the potential of this method for expanding possibilities for relating with others beyond empathy. Overall, we find that incorporation of the more-than-human in smart city research requires further examination of the kinds of just relations that researchers aim to create through inclusion of the more-than-human, as well as the inclusions and exclusions that are required to achieve futures perceived as desirable.

Keywords: Smart city, Forum Play, More-than-human, Empathy, Urban futures, Sustainability transformations

Introduction

Aimed at tackling the urgent socio-ecological problems of urbanization, researchers on smart cities have discussed how to do justice to the humans, and increasingly, more-than-human beings, who live in them (Martin et al., 2018; Datta, 2019; Anastasiu, 2020; Sheikh et al., 2023a; Houston et al., 2024; Tedeschi, 2024). Smart cities are often promoted as green solutions for urban planning practice, but the tensions between smart technologies, sustainability, social equitability, and justice have not yet been resolved (Martin et al., 2018; Rosol and Blue, 2022). These tensions exist alongside critiques of technocentric solutionism in smart cities, which challenge the assumption that complex urban problems can be neatly resolved by

smart technologies and big data (Kitchin, 2014; Yigitcanlar et al., 2019). This highlights the challenges of practicing and theorizing about smart cities, as no singular, universal guidelines exist for their development. Instead, smart city frameworks emerge alongside diverse urban planning strategies that envision vastly different futures, leaving open concerns about who decides what the smart city entails (Luque-Ayala and Marvin, 2015; Chin and Guthrie, 2023; Zaman et al., 2024) and who benefits from it (Coletta et al., 2019; Burns and Andrucki, 2021; Zaman and Hertweck, 2022). For instance, some approaches are framed within sustainable growth paradigms and can have overlapping concerns with creative, resilient, and global cities (Hatuka et al., 2018). Other researchers have written on the factors of smart cities which emphasize social justice among humans (Alizadeh and Sharifi, 2023) and multispecies justice among human and nonhuman others (Mancini et al., 2024). Some smart city research suggests that these justice tensions may be addressed through nature-based solutions (NBS) (Branny et al., 2022). This research has led to multiple expectations about what justice in the smart city includes.

In this article, we call for a more embedded and relational view of the smart city that acknowledges the web of relationships between humans and other species. We are provoked by Tan Yigitcanlar's proposal for a truly

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smart city: “an urban locality functioning as a healthy system of systems with sustainable and balanced practices of economic, societal, environmental and governance activities *generating desired outcomes and futures for all humans and non-humans*” (2018, p. 108, emphasis added). Even taking desirability for granted in this lofty goal for a transformative smart city, the literature still grapples with how this inclusivity would manifest itself without speaking *for* other beings or simultaneously idolizing and appropriating their positions (Haraway, 1999). For example, Sheikh and coauthors (2023a) have turned to Indigenous and multispecies scholars for direction on how researchers may begin to listen to the stories of diverse beings (including and certainly not limited to diverse humans) in cities. It remains unclear how the more-than-human intervenes in ideas about desirable futures in the field of smart cities.

This problem is especially pressing given a push for more-than-human participation and inclusion in a just smart city, despite research showing that smart cities can implement participatory measures without being responsive to the needs of marginalized human residents (Ghosh and Arora, 2022), or can be tokenistic in their participatory efforts (Cardullo and Kitchin, 2019; Levenda et al., 2020; Waghmare, 2024). This is consequential because participatory measures for increasing civic engagement and participation in urban planning can be used as a blanket approach to resolve urban problems without actually improving them. The question of what multispecies inclusion means and how it can be achieved within current structures and policies adds another layer of complexity to participation. Multispecies scholars emphasize completely new forms of deliberation and representation, with ontological shifts that consider more-than-human others, from animals to ecosystems, and with varying degrees of sentience, as subjects of justice (Celermajer et al., 2021).

As these fundamental meta-level questions of justice and inclusion are considered in relation to efforts to make smart cities more just, actions guided by underlying normative beliefs that should be thoroughly examined by researchers. Past studies have seen that sustainability researchers are guided by their ontological and epistemological assumptions (Hakkarainen et al., 2020), contradicting assumptions that scientific knowledge is value-free (van der Hel, 2018). These assumptions should also be made visible in the context of smart city research, especially regarding the ontological politics of what desirable futures can and should look like. Therefore, we examine the roles of smart city researchers and students in deciding what is meant by “desired outcomes for all,” as some researchers try to acquire and argue for greater sensitivity to the possibilities of more-than-human interdependencies in smart cities (Clarke et al., 2019; Van Patter, 2023). The rest of this introduction describes the development of the more-than-human in smart city literature, and the motivation for Forum Play methods in this work.

The smart city and the more-than-human

Although there is no single agreed-upon definition of the smart city, research on smart cities tends to include technology-oriented innovations to resolve the pressures of growing urban environments, while supporting economic growth (e.g., see Gracias et al., 2023; Foth, 2025). Smart city technologies have been critiqued for an overemphasis on technocentric solutions that may reinforce human structural injustices (Robinson and Franklin, 2021; Baker, 2025) and hierarchies between humans and other species (Sheikh et al., 2023b). In response to these concerns, researchers have drawn attention to post-anthropocentric and more-than-human smart cities, which aim to counter the harms caused by human-centered smart urban design (Clarke et al., 2018; Yigitcancilar et al., 2019; Foth, 2025).

The term more-than-human refers to a relational ontological understanding of the diversity of lifeworlds extending beyond western scientific knowledge-making. Philosopher David Abram has explained that the more-than-human was intended to fill a terminological gap, enlivening the realm of humankind as part of a more-than-human world which exceeds human understanding (Abram, 2017; 2024). We note that the term multispecies exists in parallel and mingles with more-than-human (e.g., see Tsing, 2015; Haraway, 2016). For this research we use the term more-than-human instead of multispecies to emphasize relations over individual beings and species. Therefore, beginning from Maria Puig de la Bellacasa’s definition: “things, objects, other animals, living beings, organisms, physical forces, spiritual entities, and humans” (Puig de la Bellacasa, 2017, p. 1), we further recognize that these beings do not exist prior to their relations (Barad, 2007). Sarah Whatmore (2006) has described the more-than-human as a much-needed expansion of how to consider the relations between science and society that requires risk-taking and experimentation in research, especially considering the paradigm-shifting requirements of sustainability transformations (Horcea-Milcu et al., 2024).

The more-than-human has found purchase in smart city research as a response to anthropocentric participation mechanisms in smart urban planning (Clarke et al., 2018). Scholarship has recently pursued possibilities for including more-than-human relationalities, or multispecies others as part of smart governance and design (Heitlinger and Comber, 2018; Sheikh et al., 2023a; Sheikh et al., 2023b; Mancini et al., 2024). Scholars also call for more-than-human principles as an alternative to capitalocentric norms in the smart city (Foth et al., 2020). However, this field is still just beginning to unravel latent assumptions about human and multispecies agency, and how these discussions relate with efforts to limit ongoing harms to more-than-human worlds. In a recent example, Sheikh et al. have pointed to how digital biodiversity databases for smart urban governance are merely one mode of telling multispecies stories, which can prevent humans from hearing the stories of multispecies others on their own terms (2023b). This gap in understanding remains critical considering research indicating that more-than-

human urban design principles can still be used to reinforce neoliberal values in the smart city (Prebble et al., 2021). Accordingly, we find it necessary to engage with the assumptions held by smart city researchers and students¹ about more-than-human relations.

Forum Play for exploring more-than-human relations

Recent scholarship suggests that transformative change should encourage inter- and transdisciplinary research through embodied, situated, and more-than-rational ways of knowing (Galafassi et al., 2018; Bentz et al., 2022a; Vogel and O'Brien, 2022; Castellazzi et al., 2024; Koenig et al., 2025). Scholars also call for pursuing embodiment and creative arts in research methods to examine values and biases, and further, the structures that support/are supported by them (Bentz et al., 2022b). These methods prioritize processes and relations over solutions-oriented roadmaps of "how to get there" (Springgay and Truman, 2018; Vogel and O'Brien, 2022). In this vein, past research has implemented walking methods to uncover subjective experiences of datafication and surveillance in smart cities (van Es and de Lange, 2020; Butot et al., 2023). Embodiment in research methods has been trained toward children's placemaking practices in smart cities (Peacock et al., 2020), and children's experiences of smart cities have been the focus of situated research rationalities in general (Ghafoor-Zadeh, 2023; Spinney, 2024).

To continue explorations of more-than-human relations in the smart city, we have worked with Forum Play, developed as a method for exploring multispecies perspectives (Lehtonen and Hakkarainen, 2025). Acknowledging concerns about the injustices of humans speaking for multispecies others in urban governance (Kirksey and Chao, 2022; Sheikh et al., 2023b), we also suggest that a more-than-human approach does not mean the erasure of the human from research. Rather, we see this method as one aspect of storytelling that allows us to understand human experience in relation with others (Harris, 2022).

Forum Play partially derives from Forum Theatre (Österlind, 2011), one of a suite of performance-based arts methods for challenging and understanding political oppressions through the *Theatre of the Oppressed* (Boal, 2008). Theatre practitioner Augusto Boal developed the Forum Theatre method following his exile from Brazil in 1971 and was heavily influenced by educator Paulo Freire's *Pedagogy of the Oppressed* (Babbage, 2004). Freire, drawing from Brazil's colonial legacy, grounded his work in critical pedagogy and in dialogic learning as a process to become aware of social and political contradictions and

therefore to realize one's position of oppression and change the course of events (Freire, 2017). Forum Theatre therefore has a history built on raising political consciousness and the interrogation of assumed political realities (Babbage, 2004). Past research has used Forum Theatre and Forum Play to help uncover power differences in contemporary sustainability challenges with groups including local landscape management members, early-career scholars of sustainability science, and community groups facing climate change (Brown et al., 2017; Haider et al., 2018; Olvera-Hernández et al., 2023). It has been a successful method for embodied exploration of diverse values and empathy, without necessarily defining solutions to conflicts (Olvera-Hernández et al., 2023). Importantly for this research, recent work has also shown how Forum Play can overcome challenges related to knowledge extractivism in research, as the method allows for researchers and participants to learn together (Mancilla García et al., 2025).

Uncovering assumptions about desirable cities in smart city research

In this article we explore more-than-human relationality in smart cities through Forum Play involving smart city researchers and students. Although the studies above have discussed how a more-than-human smart city might be imagined and put into practice, it is not yet understood how these scholars and students *think with* the more-than-human, so that the assumptions that they make about its inherent interdependencies are recognized as non-innocent (Puig de la Bellacasa, 2017). This question is important to consider for the ontological politics of how research on the smart city is conducted and how it is taught, because concepts such as the more-than-human are not inherently innocent or politically benevolent.

Therefore, we address the exploratory research question: *What can Forum Play reveal about academic assumptions regarding more-than-human relations in smart city research?* Our research question is not merely a myopically reflexive dive into how academics view their own work. Rather, our objective is to use this method to surface assumptions of how academics think about more-than-human relations in smart city contexts. This article therefore attends to calls to take interdisciplinary, embodied approaches for encouraging sustainability transformations in smart city research by recognizing what is unruly, emergent, and incommensurable (Temper et al., 2018). In the following section, we explain our study design. In the next section, we present the initial theoretical contributions of this exploratory research.

Methods

Description and piloting

In a more-than-human Forum Play, participants are asked to write and perform a short (3–5 minute) play that explores the complexities of a conflict situation. These complexities should not be resolved by the end of the play. The play is performed once for the larger workshop audience, followed by a quick debrief over what happened. The play is then repeated, and during this time the

1. We recognize that referring to study participants as "smart city researchers and students" does not function as a literal identity. By referring to them this way, the authors mean to suggest that participants have knowledge about smart urban development and the consequences for their research and studies. This shorthand does not intend to collapse the participant group into a singular identity, especially given that contributions to smart city research come from many disciplines, including but not limited to urban geography, urban design, and political ecology.

workshop audience are allowed to step in, replace roles, or ask questions of the characters. In this second performance, all participants explicitly share the role of “spect-actors,” meaning that everyone has a part in shaping the plot, even if their actions do not change the outcome of the play. By stepping into the scene, a spect-actor is meant to experiment with and intervene in it.

For this work, we facilitated a series of more-than-human Forum Plays, drawing from Lehtonen and Hakkarainen (2025). We piloted the study design in 3 cases: once in a summer school among sustainable arts and design students and practitioners, and twice with master’s level students involved in courses related to ecological economics and NBS. During pilots, we received feedback that allowed us to refine the instructions for the Forum Play and develop an interview script.

Sampling and data collection

Participants included university students and researchers who study and research smart cities, urban transformations, and aspects of smart urban development including law, transportation, and urban green infrastructure. All participants gave their informed consent to be present in this study and were provided with information about GDPR regulations relevant for this work. Participants were recruited by snowballing with purposive sampling. Study participants were selected based on their self-reported knowledge about smart urban planning and systems. Due to the sampling procedure and study design, we do not claim representativeness in the results of this work. Rather, we focus on the richness of data collected during the Forum Plays, interview processes, and exploratory approach of our analysis.

With this sampling method, we facilitated 3 workshops with 6, 9, and 22 participants. Two workshops were held among student participants from transdisciplinary urban planning classes, one at the bachelor’s level and one at the master’s level. One workshop was held among early-career and senior researchers with experience in smart urban planning and systems. Of the study participants, 12 agreed to a 1-hour follow-up interview. The follow-up interviews were recorded and held either in-person or online. All recorded data were transcribed.

In the workshops’ introductory materials, we described the Helsinki-Uusimaa smart region initiative as an example of a smart city project, which emphasized digitalization, research and redevelopment, and sustainability. At the beginning of each workshop, participants were asked to write down 5 terms or phrases that describe the smart city for them. The purpose of this short pre-survey was to inspire participants’ thinking about the smart city concept and allow for a starting point for reflection during the follow-up interviews. The surveys could be filled out in English, Finnish, or Swedish. Theatre-based research often involves a degree of shyness by participants, who may be unfamiliar with the method (Olvera-Hernández et al., 2023). To partially mitigate this issue, we explained the rules for the plays in advance. We also facilitated warm-up activities that allowed participants to explore the expressive movement of their bodies. This reflects Boal’s (2008) first and second stages of practices to help participants

shift from observers to participating subjects and builds an environment of creativity and safe expression (Österlind, 2011). After this warm-up, the workshop facilitators performed a lighthearted example. We stressed that we were not asking participants to find solutions to entrenched political problems. Rather, we aimed to provide a relaxed space of rethinking problems that can have serious consequences.

Participants were given a broad remit on the content of their plays but needed to follow 3 guiding structures (Appendix 1, Instructions). First, the play needed to be set in a smart city. Second, participants could perform as any more-than-human character. While this included other humans, participants were not allowed to perform as themselves. Third, the play they wrote was required to have an unsatisfying ending. This means that the play needed to show a conflict that escalated but did not resolve. Forum Plays specifically explore a situation of oppression (Österlind, 2011). During pilots, participants found the rigid dichotomy between oppressor and oppressed confusing, as within one scene a character could be oppressed, oppressor, or both. To accommodate this nuance, we kept the terminology during the workshops but encouraged participants to think about how their characters may be perceived from multiple perspectives. After reviewing the instructions, participants were split into groups of 3–6 and given about 45 minutes to brainstorm. The content and intervention summaries made during each play can be found in **Table 1**.

Following the workshops, participants were invited to an optional interview lasting 1 h. This interview was guided by a set of open-ended questions about the workshop, including writing the scene, interventions, and character development. The interviews were developed using a guide for intensive interview structures (Charmaz, 2006), allowing interviewer and participants to move between topics fluidly depending on relevant interests. Later interviews were gradually focused by early interviews and analysis, allowing for refinement of the research question, and for early conclusions to be tested alongside emerging data (Bickman et al., 2014). In this article, any quotes from each of the 37 “spect-actors” are anonymized with labels from S1 through S37. The second performance of each play is referred to as an “intervention.”

Analysis

Our analytical process emerged nonlinearly, as we (the authors) came to terms with how our data did not fit our initial expectations about what qualitative data should look like (Koro-Ljungberg et al., 2018). This is because the data from the plays were not static, meaning that they affected us emotionally and physically in real time and afterward. We collected multiple sets of intertwined data: audio recordings of the plays, notes taken by workshop facilitators during the plays, post-workshop memos written by facilitators, and post-workshop interviews with study participants. This process aligns with Harms et al.’s (2025) role-play research, which suggests that everything expressed and acted by the participants (here, we the authors deliberately include the experiences of the

Table 1. Content of Forum Plays and how they changed during interventions

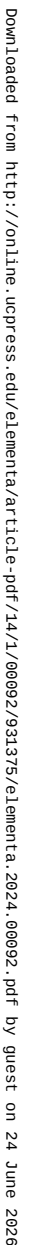
Workshop (W1–W3)	Play (P1–P8)	Description	Interventions
1	Play 1	A disease infects smart city residents. A disease-tracking app guides the sick. It seems caring but invades human data privacy. The disease is persistent and returns after each vaccination. A city resident falls into depression as they are quarantined with little communication with the outside world.	A health organization emerges to make the virus a co-citizen and stop the application from stealing patient data.
	Play 2	An electric car physically separates a human and a tree with a paved road. It claims to give humans freedom but selfishly disturbs the connection between people and nature. The human and the tree become sad when they cannot “connect.”	A bus is introduced to reduce the harms of the road. A spect-actor reasons with the car and questions its motivations.
2	Play 3	In the future, a protective AI dome is built over a city to shield it from the uninhabitable world outside. Although the people inside are happy, the AI becomes confused as a crow breaks through the dome, and chaos ensues.	A series of unexpected characters throws the security of the Dome into question, including a heat wave, a nomadic human living outside of the Dome, and their child looking for their lost pet crow.
	Play 4	In the past, a neighborhood in Helsinki is built up and gentrified as a symbol of the smart city. While city residents, including nonhumans, are dissatisfied with the results, urban developers suggest that residents should have participated in the planning process more.	Residents attempt to change the developer's mind and introduce them to a local sauna. A swarm of bees comes to sting the developer.
3	Play 5	A peaceful scene of the Elbe flowing through Hamburg is interrupted when someone on an electric scooter collides with a pedestrian. The people get into an argument, and the scooter is pushed into the river.	A police officer comes to resolve the argument and punish the scooter driver.
	Play 6	A pedestrian carrying a plastic bottle is courted by multiple waste receptacles who want the waste, including a smart recycling bin, a deposit refund system, and a human who needs the money from the pfand bottle deposit. ² The bottle wants to be recycled rather than thrown away.	A regular trash can is added to the scene. The human who needs the money from the pfand bottle deposit takes the bottle from this “dumb” trash can and recycles it.
	Play 7	In a large city, a human wants to go to work, but their ankle hurts, and they need an alternative to their bicycle commute. Various forms of transport court the human. Meanwhile, a major city street has an identity crisis from constant transport renovations.	Even more transportation options are added, including a bike lane, a home office, and Zoom conference system. The human decides to work from home.
	Play 8	An urban planner adds sidewalks and roads in a city, bulldozing over former green spaces and removing native plants. Non-native species push out the former greenery, and people start to forget about native plants.	A government advisor, specialist, and the Voice of the People show up to change the urban planner's mind.

workshop facilitators) can be relevant data. Accordingly, the facilitators needed to acknowledge how they were affected and trained by the data, forcing them to become

aware of surprising, moving, and funny moments in the plays. These moments were ultimately impossible to dismiss as irrelevant to our research question.

We were inspired by Charmaz's principles of grounded theory (2006; see also Glaser and Strauss, 2017) because this model of theory construction was suitable for our exploratory methodological approach. Hence, drawing

2. For participants in Germany and Finland, recyclable drink containers can be returned to some shops for small change (called pfand and pantti, respectively).



An example of this emerged from Play 2, in which the roads required for electric cars took up space that could be used for human–nature connections. While an electric car was self-congratulatory and drove on its designated lanes, a human reached longingly for a tree on the opposite side of the road. The interventions for this play focused on the effects of the electric car, a self-styled “symbol of the green revolution.” One spect-actor intervened as a bus, who was characterized as selfless and a more conscientious form of transportation than the electric car. However, the tree growing by the road passively occupied space. Having lost its connections with others, it could not forge these connections without human help. Another spect-actor questioned the motivations of the electric car by asking why it needed to drive so fast. However, no one addressed what the bystanding, passive tree may have needed or helped it to “connect” in other ways. During the post-workshop

interviews, 1 participant from Play 2 reflected on assumptions about which characters have agency across plays. During the interviews, S4 realized that the tree from Play 2 was more static than the virus from Play 1:

It was interesting to see how this virus is so lively and changes everything, and the tree was just standing around, and it was the human who wanted to touch it. And then we gave a lot of agency to the car. So, it was actually the most anthropocentric play ever, even though we had a person acting as the tree! (S4, Play 2)

Other groups also gave some characters more agency than others. Like the static tree in Play 2, a swan couple in Play 5 were graceful background characters who were frightened away by the human-centered altercation caused by an e-scooter accident. In the intervention, a police officer arrived to resolve the accident. However, no characters intervened to help the swans, and the swans themselves did not retaliate against the situation. This stands in stark contrast to a swarm of bees that emerged in Play 4, who retaliated and fought back against the developer. These examples indicate how in Metanarrative 1, some non-human characters were able to fight back without human intervention and some were not.

Similarly, the plot for Play 8 described a scene in which non-native plant species introduced to a park “bullied” native plants, physically pushing them out and taking over the garden plot. These native plants did not “fight back” but instead shrank to the background (see Metanarrative 2). While the urban planner who designed the park was well-meaning, their efforts were ultimately blundering, creating a situation in which non-native plants crowded out all others. As a result, the city residents forgot about native plant species. In this scene, the residents did not attempt to hold on to or relearn their knowledge. Non-native plants acted out of the desires of human planners by pushing out native species instead of potentially sharing the space or mingling in ways that were not confrontational. In the interventions for Play 8, the urban planner was met with resistance from The Voice of the People, a collective character who intervened on behalf of native plants so that some of their space would be protected. Other members of human interest groups also intervened, including a government advisor and environmental specialist who advised on how to preserve the native plant habitat. Through these examples, Metanarrative 1 shows how certain more-than-human beings (often humans or machines) are assumed to have more agency to act, and therefore bring about a just solution, than others.

Metanarrative 2: “I’m still here!”

Another metanarrative emerged as a helpful foil to “Give me space!”. Metanarrative 2 emphasizes shared vulnerabilities and interdependencies. While some participants explored the oppressed situation of their character, not all their fights with an oppressor resulted in defeat or loss. “I’m still here!” encompasses a gray space of persistent characters who may

be marginalized, ignored, or under attack, but nevertheless request that they be seen or appreciated. Sometimes, these characters even emerged as a surprise to the rest of the participants. We define Metanarrative 2 as a version of resilience that acknowledges weakness, vulnerability, or the need to recover. This differs from definitions of resilience which refer to the ability of a system to respond to a disturbance, often aiming to return to an equilibrium state, and usually for the well-being of (certain) humans (Vale, 2014).

One of the most prominent examples of this Metanarrative was seen during Play 1, in which S3 acting as a COVID-like virus returned to infect humans after multiple waves of vaccinations. During the preparation phase, they wrote their character as one at battle against the vaccinated human. After the human was vaccinated, S3 recognized “I don’t have good weapons yet, I’m young and small . . . I have to go, I die . . . but then I come back,” returning with various props to symbolize how they had strengthened. While the virus’s acknowledgment of its weakness made the human feel secure and complacent, they were not equipped to deal with the virus’s later resurgence and did not build up their own defenses (vaccinations) until it was too late. The actions of the virus demonstrate *resurgence* through cycles of weakness and power.

Play 4 depicted a scene of chaos and confusion in an otherwise orderly smart city setting. The scene involved a human settlement protected by an AI dome from an uninhabitable landscape, displaying resilience more in line with maintaining a status quo. A crow was the first “intruder” to disrupt the AI security system. The end of the intervention resulted in no clear solution, with multiple characters introduced to outwit and rattle the Dome. Even though the Dome was meant to protect inhabitants from an uninhabitable outside world, S13 intervened as a nomad, unscathed and living outside of the city, looking for their stolen child. During their interview, S13 reflected that this character represented a different way of living than what was proposed by the Dome inhabitants, a “way of living with, and living regardless of that particular environment.” This intervention was surprising for the workshop group and the facilitators, who believed the play’s story which suggested that human life outside the Dome was impossible. In the post-workshop reflections, participants agreed that the shift from “dystopia to confusion” was more genuine and reflected how events occur when no one intends harm. During their interview, S7 reflected on how the crow was given an agency that didn’t fit the prescribed pattern of relations set by the dome.

It seemed like a paradox to have that piece of nature [a crow], that kind of moves along the lines. We imagine an apocalyptic setting, and often in science fiction you have these repeated notions of protected societies in an otherwise barren land. And then there’s this idea that there’s either no animals or there’s hostile animals outside. But then this passing animal seemed like a paradoxical entity in that imaginary. (S7, Play 3)

Other characters connected their request to be seen with a simultaneous lack of control over their situation. In Play 6, S20 acting as a plastic bottle made a claim for respect and recognition, pleading: “I do not want to be thrown away.” We also note that some aspects of each Metanarrative could be seen in a single play. For example, during the preparations for Play 8, the S29 acting as the native plant species thought aloud about the dynamics between their character and the others in the play: “What do plants say?[short pause] Maybe the landscape and I could be happy together. And the city planner will come and change the landscape. And you'll [the nonnative plant] push me away, but I come back. But then the invasive species comes in . . .” While S29 acknowledged that their character was overpowered, they still gave the native plant species the agency to be resilient against repeated attempts of removal.

Depicting others through boundaries and overlaps

From our analysis, we also draw attention to how the agencies of human and nonhuman characters were depicted during the plays, especially in relation to other characters and the spect-actors themselves. When participants were asked why they performed in certain ways, they emphasized that it felt right in the moment, that they acted spontaneously, or that the character was informed by past experiences. This spontaneity or reference to past experience shows how spect-actors performed intuitively, without consciously thinking about the reasons why a character behaved one way or another. A simple example of this could be seen in how some inanimate and immobile object characters, like the smartphone and plastic bottle, were relatively inert in their movements, or required human characters to move them around. However, they did have the ability to speak and express desire, albeit in limited ways.

The intuitive nature of these depictions led some participants to find a contradiction or boundary line in the representation of their character. One striking example of this emerged in Play 1 around the notion of responsibility and care for others. While S1 acted as an invasive health-care app for a smartphone, they guided a sick human (S2) through their illness by suggesting vitamins and vaccinations. At one point they even comforted the human, saying “I’m here for you,” but their actions were ultimately limited by their character. When reflecting on this moment during the post-workshop interviews, S1 remembered how constricted they felt in the depiction of their character’s agency versus their own:

I wanted to help her, tell her to just contact her family and friends, because I am technology . . . I was frustrated in the moment because I couldn't say that. (S1)

While interacting with other characters, S1 found a border between the agency they gave to their character, and how they would act themselves. Another boundary was found during the interventions for Play 1. S4 emerged as a health organization to censure the application against extracting

patient data, and to deem the virus a co-citizen. In the post-workshop reflections, the participants agreed that they were uncertain as to how this kind of co-citizenship would actually work when extending inclusivity to a virus. However, S4 reflected in their interview that co-citizenship was more of a way to think about how to coexist with the virus: “instead of just running away, we carefully plan how much I run away and how much I expose myself [to the virus].”

In Plays 2, 6, and 7, spect-actors performed their non-living, technology-based characters (an electric car, recycling machines, and a gasoline-fueled car, respectively) as driven by a need for human approval or acceptance, reflecting the ways the object reflects a presumed human quality. For example, Plays 2 and 7 navigated the contradictions of cars as oppressive characters. In these groups, the two cars tempted humans by offering speed and freedom, showing an agency that was dependent on human desires. This was evident in Play 2, where S5 claimed “I can take you anywhere! Closer to nature, let me show you . . .” This mirroring of human desires may gesture to how cars are not selfish on their own, but they can be used in selfish ways.

In another example this mirroring from Play 7, S23 acted as a major urban boulevard by collapsing on the ground in exhaustion. They despaired, saying that they were tired of constant street renovations and didn’t know if they were supposed to be for human pedestrians, bikes, or cars anymore. The group presented this humorously as an identity crisis. In the end, the boulevard’s crisis did not get addressed due to the urgency of the human’s predicament. As the boulevard’s dilemma played out, it was evident that while the character could not be known to “feel” as humans do, this mirrored agency gave the opportunity to discuss how it may feel through a human lens. Finally, these depictions were not limited to nonhumans.

Indignant resident, S13: *You said I had a voice in this. You didn't listen to me.*

Land developer, S15: *But look at all these happy people living in these beautiful buildings. The people who belong here, they're happy.*

Indignant resident, S13: *But it's just so ugly. Why?*

Land developer, S15: *Well, you should have contributed more to the participatory planning processes.*

(laughter from the spect-actor audience)

Play 4’s participants acknowledged that their scene involved oversimplified caricatures. For example, a land developer (S15) was depicted as adamant that their plans for a new neighborhood were necessary to clean up and capitalize on wasted urban industrial space. S13, a dissatisfied resident, was disappointed with how the space was used by the developer. In their follow-up interviews, both S13 and S15 indicated that their approaches to their characters were based on personal experiences and past work.

While these participants did not necessarily agree with the depiction of their character (S15) or personally relate with their feelings (S13), by starting with an oversimplified version of this character, they were able to find the boundary of their complex relationship with it.

Multiple desirable futures

Through the more-than-human relations in the Forum Plays, we show how desirable futures in more-than-human smart cities are contested and always incomplete, suggesting the need for discourse that is more commodious than desirable futures. In our study, the Forum Play method provided a setting of playful experimentation. Spect-actors were able to examine the consequences of enacting agency through their character and watch the play change and unfold as they came into dialogue with other spect-actors. This was the case even as the initial ideas of the play's plot was shared among group members. More-than-human relations therefore emerged *through* the participants' engagements with the Forum Play method, producing characters who were variously aware of their dependencies and interdependencies with others.

Through our analysis, we highlighted the ways more-than-human relations can be depicted in two mutually constitutive metanarratives about agency. These metanarratives highlight accountabilities and obligations that arise as researchers can prioritize certain species over others, even when attempting to resolve urban problems. These accountabilities and obligations show how desirable futures are multiple, meaning that their politics are contingent upon the relations at stake, and that they can exist in conflict and synergy with one another at the same time (Law, 2004). This aligns with previous research discussing the politics of desirable multispecies futures, which demand that we think in terms of shared vulnerabilities among species instead of trade-offs (Wijsman et al., 2025). We show how Forum Play methods can contribute to these discussions and prompt us to parse goals for desirable more-than-human smart cities.

Further, these findings are important because they show how acting, researching, and planning cities with others in mind is always a political exercise. This is to say, anthropocentric assumptions about the relative desirability of some beings and species over others can occur even when the goal is a desirable future for all. Our metanarratives highlight the awkward, always non-innocent relations around multispecies death, killing, and violence (Ginn et al., 2014) by playfully engaging with how certain beings and species might be given more agency to retaliate against harms done to them. Some characters, like the virus (Play 1) and the bee swarm (Play 4), retaliated against the violence done to them through vaccination and housing development, respectively. Other characters were given more freedom to run away or were not given the ability to act on their own at all, as seen in *through the tree* (Play 2) and the swans (Play 5). These results are illuminated by the multispecies entanglements seen in Heitlinger and Comber (2018). Their study refers to the collective responsibility in smart urban agricultural communities to grow local food. Participants include both the humans involved, and the infrastructure they created, and

the other species which live in and among the gardens. However, this collective responsibility is a set of relations that are always partial and occurring in various combinations. For example, weeds, slugs, and snails are managed to reduce their impact on the garden, but pollinators are encouraged. Those occupying the space of "pest" are unwanted, but not passive; they are resilient and always returning. We suggest that our metanarratives are not incompatible with Yigitcanlar's definition above. However, these findings have implications for imagining and designing future smart cities when desirability is contested.

Finally, we highlight how participants encountered boundaries and overlaps between themselves and their characters. Spect-actors found themselves dealing with these boundaries and overlaps spontaneously through their depictions of more-than-human characters. This finding moves beyond indicating that there are complexities in navigating so-called desirable futures for human and nonhuman beings in the smart city. They also point to the limits of empathetic relations in a smart city composed of difference, expanding on previous scholarship on more-than-human smart cities promoting just and empathetic relations (Mancini et al., 2024). Our findings note the differences between bodies and their sensory capacities, which can place limitations on direct understanding and multispecies solidarity and show how this understanding will in some ways always be partial (but not irrelevant) (Verlie and Neimanis, 2023). Burcher (2018) suggests that focusing on the similarities and empathetic connections between beings will bring about incomplete relationships between them, so that we may see these beings only through what is recognizable to us. Rather than thinking about more-than-human others solely on human terms, some participants found divisions between themselves and their character which they were unable to reconcile. Similarly, although their characters might have mirrored human qualities or desires, they were not necessarily the desires of the spect-actors.

Unable to fully comprehend the embodied realities of this other being, the Forum Plays opened possibilities for participants *to act as another yet never fully become them*. This critique has been leveled against Forum Theatre in the past, as some have suggested that if a spect-actor cannot fully replace their character effectively, then this is a fault in the facilitation (Babbage, 2004). However, Babbage goes on to add that Forum Theatre (here, Forum Play) can still be valid when a spect-actor does not fully identify with their character, if the play can be opened further to investigate empathy. We suggest that the Forum Play method can allow participants to explore ways of understanding more-than-human others without necessarily relying on empathy. While the Forum Play method does not allow for the stories of characters to be told in their own right, spect-actors did encounter the boundaries of stories that could reasonably be told from their own perspective. Through an embodied knowledge of themselves as humans and their characters, spect-actors were able to express their understanding of the character and explore situations of alterity: that is, respect for and response to difference (Burcher, 2018). We align with Westerlaken et al. (2023) who find that more-than-human

alterity can be useful to unsettle and disrupt prevailing smart city concepts about positive more-than-human relations. These boundaries and overlaps are cause for further investigation into how Forum Play can help explore other desirable more-than-human relations, not just empathetic ones.

Limitations and future directions

The Forum Play method is inseparable from these results. Forum Play has potential for helping understand how to understand the more-than-human smart city as part of sustainability transformations; however, the use of creative and embodied research methods does not inherently pave the way for the smooth implementation of transformations, and researchers have noted that these methods come with their own challenges and structural limitations (Harms et al., 2024; Heines et al., 2024). Others have expressed relevant concerns about the possible detrimental effects to proposing arts-based research for instrumental purposes (Galafassi et al., 2018).

We also cannot make claims of human diversity within our participant group. Any of the human voices not included in this study would have shaped the narrative of our results along a different path, and many participants acknowledged that the composition of their groups was a major factor in determining the content of their plays. The consequences of this unfold from the plots of the plays devised by groups, and how the spect-actors interact with one another in the guise of their characters. Thus, the meta-narratives that emerged from our analysis may have been different had we conducted this study among researchers in other cities. Without absolving our work of these limitations, there is no combination of participants who would have been wholly innocent of these power dynamics. In sum, this study does not yield prescriptive results, as this would run counter to the intended purpose of the method (Babbage, 2004). Future research using creative and embodied methods that is open to unruly, unexpected results is needed to better understand the kinds of relations that are brought about with more-than-human principles.

Conclusion

In this study, we facilitated a series of more-than-human Forum Plays among smart city researchers and students and analyzed how more-than-human relations were enacted by the study participants. Ultimately, we find that the Forum Play format created possibility spaces for observing assumptions about agency in how smart city researchers and students depict more-than-human relations. These complexities were exhibited in the plays' metanarratives and through embodied depictions of characters. Transformative smart urban futures are therefore dependent on how academics can handle the multiplicity of relations that are enacted in this field, and not only through relations that are recognizable to human researchers. We show that the inclusion of the more-than-human in the smart city does not automatically produce just and desirable futures. Rather, it can be used as a way to see the necessary inclusions and exclusions that are made when producing desirable futures for humans and other species.

Data accessibility statement

Respecting the privacy agreement between researchers and participants, interview and analytical data will not be shared.

Supplemental files

The supplemental file for this article can be found as follows:

Appendix 1 (JPG): Instructions provided to Forum Play participants.

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Author contributions

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Analysis and interpretation of data: SZ, EC.

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