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Terrains of care in the smart city: sensemaking by creative communities of practice

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Abstract

Critical smart city research has presented wide-ranging risks of technocentric urban development. One critique lies in the kinds of citizenship directed under smart urban paradigms, which do little to account for residents' practices of care. This paper is an ethico-onto-epistemological re-examination of smart cities through the lens of care practices specifically focusing on creative communities of practice. We use an enactivist empirical approach to help uncover experiences of sensemaking in the smart city held by three creative communities of practice in Helsinki. Through in-depth interviews with $n = 22$ urban planners, artists, and community space organizers, we assessed these groups' differing and overlapping sensemaking processes. Utilizing 5E sensemaking processes (embodied, extended, enacted, emotive, and embedded) as a flexible analytical framework, we identify and interpret their practices of care as ways of sensemaking in a developing smart urban environment. Our results depict terrains of care in which participation and citizenship in the smart city is not neutral, but embedded in affective engagement, navigating rules and institutions, and cultivation of joy and inspiration. We use our findings to discuss what these interweaving terrains of care mean for citizenship and transformational change in the smart city.

Highlights:

- We identify interweaving 'terrains of care' that can inform how cities can more effectively engage with citizens in transformative smart city development.
- An undue emphasis on defining the smart city concept tends to reduce complexity regarding the practices that exist alongside it.
- Citizenship in the smart city is not a neutral practice of participation, but rather embedded in care relations with one's surroundings.

Policy and practice recommendations:

- The profession of smart urban planning is inherently embedded in networks of care relations, which can help promote the situated development of smart cities as a whole.
- Emphases on participatory processes in smart cities can be supplemented by efforts to better facilitate local care networks that are already active.
- Care practices are inseparable from memory and connection with space, which informs urban planning practitioners and can be better recognized in city planning work.

Keywords: Smart city, Enactivism, Embodiment, Communities of Practice, Care

Introduction

Smart cities remain a complex potential solution for anthropocentric socio-environmental crises that necessitate radical transformative change in cities. Suggested principles for this change (McPhearson et al. 2021) lie in stark contrast to trends in smart city development, often characterized by neoliberal subjectivities, economic growth and competitiveness, and sloganism (Söderström, Paasche and Klauser, 2014; Vanolo 2014; Cardullo and Kitchin 2019a; Zaman and Hertweck 2022). Smart city researchers recognize that these motivations are intertwined with larger sociopolitical structures (Suartika and Cuthbert 2020) that fail to address urban problems and instead focus on techno-solutionism (Kitchin 2022a, b). Within calls for transformation in smart cities, theories of care remain present (Branny et al. 2022), but without a leading role in bringing about this change. In a growing field of critical research, it is important to continually re-examine assumptions about smart cities and what they mean in the context of transformative, meaningful urban life.

These assumptions come in part from seeking a unified definition of the smart city, ever tempting and eluding smart city researchers. Kitchin has outlined several basic ways researchers have tended to define the smart city: 1) ontologically; 2) epistemologically; 3) bibliometrically (outside of the scope of this paper); and 4) by examining the practices of smart city practitioners (Kitchin 2022b). We suggest that the reasons for smart cities' confounding nature lie in this premise that separates ontology, epistemology, and practice. Karen Barad has suggested that the binary separation between ontology and epistemology have produced a false impression in science that knowing and being are separable, when they are mutually co-constitutive, dependent on each other, and bound in ethical relations (Barad 2007). In their theory, Barad also proposes that discursive practices are not human-based activities but specific material (re)configurations of the world through which "boundaries, properties, and meanings are differently enacted" (2007: 139). While a specific exploration of Baradian theory is not within the scope of this article, we agree that the separation between ontology, epistemology, and practice has resulted in the current state of smart city research, in which calls to move beyond the smart city are stymied by a lack of examination into the practices that go into making them. For this reason, we make the case for not defining the smart city a priori, and instead delve into the practices of some of its residents.

In this research, we suggest that transformative approaches to smart cities should occur together with how we derive meaning in the city through practices of care (Till

2012; Williams 2017). This requires further exploration of ideas such as 'spaces of care', which have been conceptualized in the urban geography literature as socio-spatial fields of relational care practices (Conradson 2003). Feminist care traditions have been applied to research care in urban contexts, including social housing and welfare work (Power and Williams 2020). Research has also called for place-based ethics of care in planning (Till 2012), and Ghafoor-Zadeh has also examined the materiality of childrens' care practices in smart cities (2023).

The aim of this paper is to contribute to smart city research by delving into creative communities of practice, and their complex care practices in smart urban landscapes. Through the exploratory research question, "*what kinds of care practices are visible in creative communities of practice in the smart city?",* we address a research gap that shows how practices, knowledges, and ways of being are implicated in smart urban development. To accomplish this, we take an enactivist perspective to our methodological approach and provide evidence for how to understand what kinds of care practices are limited, directed, and enabled. To our knowledge, there have been no empirical case examples of the role of sensemaking by creative communities of practice via an enactivist approach in smart cities. Therefore, this work also answers calls for more in-depth research on empirical case examples of local smart city initiatives.

Right to care in the smart city

In line with proposals for transformative change, researchers are beginning to rethink justice according to principles of care and reciprocity (McPhearson et al. 2021) critically expanding the concept of citizenship for just and transformative urban futures. Questions of who and what participates in the smart city have also come to the fore, and smart city researchers have frequently lamented the limitations of participatory initiatives that amount to little more than tokenistic consultation (Cardullo and Kitchin 2019a; Levenda et al. 2020; Waghmare 2024). However, we find that researchers have overemphasized citizenship in the smart city viewed through qualitatively and quantitatively better digital participation in city decision-making, rather than focusing on what smart city residents *do*. In Helsinki, for example, researchers have promoted PPGIS (public participatory geographic information systems) as a smart city planning tool to increase the quality of democratic decision-making urban green infrastructure, although sociodemographic diversity with PPGIS remains difficult to capture (Korpilo et al. 2023). While this participatory turn sets out to remedy overly rational city planning (Krivý and Kaminer 2013; Sznel 2020), participatory-based citizenship done poorly also reinforces individualist imaginaries in smart cities (Cugurullo 2018), the prioritization of (dis)satisfaction with one's surroundings, and defined roles as alienated participants in a market-driven society (Luusua and Ylipulli 2021; Kędra, Maleszyk and Visvizi, 2023). Therefore, despite research's increased conceptual focus on participatory processes for a just smart city, the transformational processes remain limited to democratic participatory means as defined by top-down decision makers, further limiting who gets to define the smart city and how (Leclercq and Rijshouwer 2022).

What has received comparatively little focus in the smart city literature are care practices in the formation of citizenship in the smart city. Further, we argue that there has been little recognition of the inherent inseparability between practice, ontology, and

epistemology on these matters. In an expansion of Lefebvre, the "right to the smart city" (or the right to the datafied city) has become emblematic of research attitudes seeking to support community-centric cities, which recognize the complex and indeed caring ways residents participate in smart urban space (Heitlinger and Comber 2018; de Lange 2019; Heitlinger et al. 2019). While Lefebvre's focus was on the democratization of urban space and its reappropriation from hegemonic power (Lefebvre 1992) the right to the smart city has diversified this initial starting point, with the principles of co-design and urban co-creation being important branching-off points for these discussions (Foth et al. 2015). Heitlinger and coauthors have, for example, focused on facilitating stakeholder engagement through the co-design of digital technologies, where citizenship is enacted through caring for one's surroundings and meaningful interactions between inhabitants (Heitlinger and Comber 2018). However, the kind of transformational shift possible through the right to the city concept cannot be accomplished by simply adding it to existing structures of rights: it must reassociate the act of living in the city with citizenship (Anastasiu 2020). It is evident that smart city research requires continued empirical exploration of this reassociation between care and citizenship, so we may better understand not "how can we care more", but rather the complexities around "how to care" (Puig de la Bellacasa 2017).

The right to create the smart city

Driven by our examination into the relationships between knowing, being, and practices, we find an under-investigated thread in smart city research is the role of creative practices the occur alongside its production. Another stray thread is the embodied sensemaking practices that creative communities of practice use to give meaning to and take ownership of their surroundings. Some seen and some less visible, urban creative and artistic practices take space in forms including, but certainly not limited to architecture, graffiti, advertising, and music and theatre performances. Zieleniec (2017) has used Lefebvre's right to the city to examine the tensions among those who write, or create, the city, asking what role street art like graffiti has in creating just urban spaces largely driven by homogenizing practices of gentrification and commodification. Other research has pointed to the complexities of structural issues that implicates creatives in the gentrification and regeneration of cities (McLean 2017).

The top-down preservation and development of cultural heritage in the smart city are addressed in divergent ways, for example by tapping cultural heritage as a tourism resource, quality of life instrument, public service component, or sustainability goal (Angelidou et al. 2017; Dabeedooal et al. 2019). In the context of Helsinki, for example, city planning decisions to transform obsolete post-industrial spaces into cultural hubs have produced sites like Suvilahti (a public urban space and skate park currently slated for demolition for an events facility (Hyötyläinen 2022) and Kaapelitehdas, a former cable factory turned arts venue with its own story of urban regeneration (Krivý, 2013). While the arts are practiced, preserved, and invisibilized in multiple ways in smart cities, the neoliberalization of smart cities (and cities in general) has led to public arts and culture spaces both being sacrificed for and used towards the revitalization of urban space (see for example Gainza 2017).

While urban planning is often viewed as a hegemonic force to be combated against in the right to the city, a curious and interacting dynamic is a lack of research on urban planners as creative interventionists. Mack (2020) has identified urban planners as part of an inherently creative, not necessarily hegemonic process, infused with a "professional intimacy" that lends a social nature to what they do (Herzfeld 2020). This professional intimacy asks that we examine the complexities of how care may be practiced in urban planning settings. Indeed, the professional reflexivity of planners at times seems selective; Cardullo and Kitchin (2019a, b) find that planners recognize a potentially wide gulf between citizen-centric smart urban goals and what urban residents actually do, yet still favor nudging, disciplining, and framing participation as a relationship between consumption and production activity. We find that a simple characterization of urban planners stifling the creative work of smart city residents does little to capture the complexities of creative practices. Hence, we find it necessary to examine the complexities of diverse creative practices, through which we may better see the role of care in creating meaning in the smart city.

Methods and analysis

Taking an enactivist approach

This research takes an enactivist approach to cognition. Enactivist theory refers to the relational and embodied processes of sensemaking between the brain, body, and environment, and has spurred interest for its potential to help understand relational and interactive sensemaking processes (Stilwell and Harman 2021; Di Paolo and De Jaegher 2022; Nurmi 2023). Therefore, cognition is a participatory sensemaking process in which meanings are generated through interactive engagement of an organism with its environments, the elements of which are seen as participants in the process (De Jaegher and Di Paolo 2007; Stilwell and Harman 2021). We bring relationality and embodiment into an interdisciplinary smart city discussion, taking an empirical approach to embodiment via enactivism using unfolding first-person sensemaking processes to understand the relationships of creative communities of practice with smart urban spaces. Enactivism provides a valuable relational alternative to dichotomized conceptualizations of human nature and agency by approaching cognitive neuroscience with the help of phenomenology (Varela, Rosch and Thompson, 1992). Accordingly, a 5E cognition thesis provides that cognition cannot exist distinct from bodily, place-based, and emotional processes or enacted practices.

Against still widely adopted Cartesian dichotomies between mind and matter, and their roles in human agency, enactivism highlights the complex systemic nature of cognitive processes. De Jaegher and Di Paolo (2007) contend that sensemaking is participatory and enacted: social and environmental interaction *and* physical encounters constitute cognition through co-creation of meanings in embodied participation. Enactivism thus highlights the meaning of participation in sensemaking processes and care for the quality of interaction with the sensed for both epistemic and ethical reasons (Colombetti and Torrance 2009; De Jaegher 2021). We find that enactivist theory is in line with calls for situated knowledge creation in smart cities and focuses on its inseparability from care practices. This allows for the possibilities of technological urban development, without focusing them (Shelton, Zook and Wiig, 2015; Coletta, Heaphy and Kitchin, 2019).

Resonating with those situated knowledges, embodiment via thinking and knowing sit within complex webs of care (Haraway 1988).

Sample

We discuss creative practice in the context of *communities of practice,* through which we argue that it is possible to grasp better the production of Helsinki as constantly negotiated within socio-cultural contexts (Wenger 1999; Mack 2020). In anthropology, communities of practice have been useful in describing diverse ways of knowing that arise from social and material contexts for training and learning (Grasseni 2007). Herzfeld advocates for the study of "planners, not only in terms of their work habits and formal training, but also as social actors" (Herzfeld 2020: 44). Consequently, we study artists, organizers, and urban planners situated within their communities of practice.

We identify members of these three communities of practice as a) individual representatives of several key institutions influence the development and implementation of urban planning measures in Helsinki, collectively referred to as '*urban planners*'; b) *artists*, defined as those individuals who engage with spatial surroundings to create artistic objects and performances and; c) individual *organizers* of community gathering spaces. We relied on purposive and snowball sampling, initially sending emails, and inviting participants in-person when appropriate. Each interviewee was emailed an information sheet, GDPR privacy statement, and voluntary informed consent form. For those individuals who consented or declined to be interviewed, we asked that they recommend other suitable interviewees.

This research took place from August until December 2022. Twenty-one in-depth interviews with twenty-two ($n=22$) interviewees were conducted lasting approximately one hour each, involving 10 primary artists, 5 primary organizers, and 7 primary urban planners (see Supplementary Material for interview script). We began with a key assumption about the plural relationships between identity and practice, where identity is recognized as a lived experience, yet is also inherently social, cultural, and historical (Wenger 1999). Therefore, it was possible for individuals to be involved in more than one community of practice ($n=9$). For clarification in our results, we labeled each individual's interviews with their primary occupation (U for *urban planner,* A for *artist*, or O for *organizer*), then secondary occupation, determined from the context of their interviews, followed by their interview number (for example, interview AO22). In acknowledging that interviewees may fall within two communities of practice, we aim to circumvent stereotypes made by eliding the lived complexity of identities (Wenger 1999).

The lead author, in charge of the interviews for this research, adopts a situated stance towards the social phenomena in this research. Their positionality is embedded in their research context and influenced by their roles within their own academic community of practice. These perspectives place the lead author outside of the scope of objectivity, but also place them as a situated participant in the creative dynamics of the city. From this perspective, the interviews conducted were exploratory in nature, and sociodemographic representativeness was not necessarily the goal of participant selection. Rather, this research prioritized identifying individuals within the communities of practice stated above. Additionally, one interview was conducted with two interviewees at the same time. This was permitted due to scheduling constraints and deemed appropriate

as the two interviewees worked in the same space and collaborated closely. Quotes from this interview are indicated with an asterisk (*).

Analysis

Interviews were transcribed by hand and analyzed using a hybrid deductive-inductive approach derived from Stilwell and Harman (Stilwell and Harman 2021) using NVivo 12 software (Fereday and Muir-Cochrane 2006). Stilwell and Harman (2021) refer to the enactivist approach as a flexible resource grounded in phenomenology to understand sense-making practices. Their coding process suggests using 5E cognitive theory (that is, Embodied, Embedded, Enacted, Emotive, and Extended) as a flexible analytical framework in phenomenological research on subjective experience. Our working definitions of the five E's are stated in Table 1. This analytical framework was used in an initial round of exploratory, deductive coding. During this round of coding, we allocated fragments of transcripts which helped to further define and clarify the 5 E's. While these processes are separated and listed for comprehension, this is not to imply that they are distinct and able to exist separately from one another. Stilwell and Harman emphasize that these are interrelated processes and have found it fruitful to consider additionally emotive sense-making to acknowledge the role of affective framing (Stilwell and Harman 2019). For consistency, we maintained the following 5E breakdown.

For our second round of inductive coding, we performed a thematic analysis, emphasizing care to identify overarching themes between sensemaking processes. At this stage, we acknowledged an issue indicated by Stilwell and Harman, who found the initial separation of the five sensemaking processes proved to be somewhat artificial, but also that "it helped break up and organize data and forced us to consider how the Es were at play" (Stilwell and Harman 2021:9). While generating themes, we drew connections between them, their speakers, and their sensemaking processes. We recognized three important themes in which participants incorporated care through relational activity with their surroundings. These themes coalesced into a depiction of "terrains of care", derived from Puig de la Bellacasa's (2017) definition involving "ethics-work-affect" dimensions, which

Table 1 Cognitive sense-making processes and their definitions used in initial deductive coding process. Definitions were clarified based on coding, and partially derived from Stilwell and Harman 2021

Cognitive sense-making process	The smart city shapes and is shaped by…
Embodied	…bodily processes and interactions between bodies, including minds, knowledges, spiritualities, and identities
Embedded	…a person's diverse relationships in socio-cultural spaces, including studios, museums, green spaces and urban nature
Enacted	…possibilities for action, or the affordances that are made possible by the interactions between a person and their environment
Emotive	…emotions and affects, or their lack, which guide a person towards important parts of themselves and their environment
Extended	…engagement with institutions, organizations, and their processes that guide certain possibilities over others

may sit in contradiction with one another, and not in equal distribution. We describe these terrains of care in further detail below.

Terrains of care

By drawing from care and enactivism in our analysis, we were able to uncover certain unseen sensemaking practices in smart cities. These care-full sensemaking practices elaborate on an entangled citizenship of shared responsibility (Williams 2017), and arise from the sometimes intermingling, sometimes dissonant five sensemaking processes. These practices both distance creative communities of practice from the smart city and draw them closer, revealing some unresolved, generative tensions as described in Puig de la Bellacasa's "ambivalent terrains of care" (2017) where care is not always intuitive, positive, or beneficial for the carer or cared-for (Murphy 2015). When elevated, these unseen elements amount to terrains of care, which may be used for guiding transformative change in smart cities (Fig. 1). We show that care expands on the smart city by displaying the participation of creative communities of practice as inextricable from the ways that they care for/in it.

We shape our discussion as a depiction of a smart urban landscape where communities of practice make sense of their surroundings through three interlinked care practices: 1) affective engagement; 2) navigating rules and institutions, and; 3) cultivating joy and inspiration. This depiction in Fig. 1 brings together the five intermingling sensemaking processes. At times some are more visible than others, but one cannot be untangled from the rest. These terrains of care present a non-neutral citizenship, occurring at varying temporalities that require participation in/with one's surroundings (Cook and Trundle 2020), expanding on possibilities for citizenship that touches on everyday routines, meanings, and memories (Till 2012). We begin by observing that creative communities of practice enact practices of care in affective tensions. This sensemaking creates vulnerabilities at personal and/or professional levels, which provide emotive depth to commentaries on the right to the smart city. We next present evidence of how care practices can be circumscribed by understandings of rules and social expectations, exploring how institutional organization and professional practice move within expectations of privatized smart urban spaces. We end with the possibilities for cultivating joy and inspiration, emphasizing the mutual responsibilities present in Helsinki's smart urban space. We stress that an individual's personal experience and their practice cannot be reduced to a dichotomous examination of, for example, urban planning as a dispassionate practice, and artistry as purely emotive.

Affective engagement

The groundwork for these terrains of care lies is rooted in affective engagement (Colombetti and Torrance 2009), highlighting emotive, extended, and enactive sensemaking processes (Table 1). These affective engagements are reminiscent of previous calls for cities to recognize caring ethical relations inherent to more-than-human interdependencies (Wiesel et al. 2020). Key here are the professional intimacies of the communities of practice, where the personal and the professional intertwine (Fitzgerald et al. 2002) in connection with space and time. Affective tensions are present in organizers who

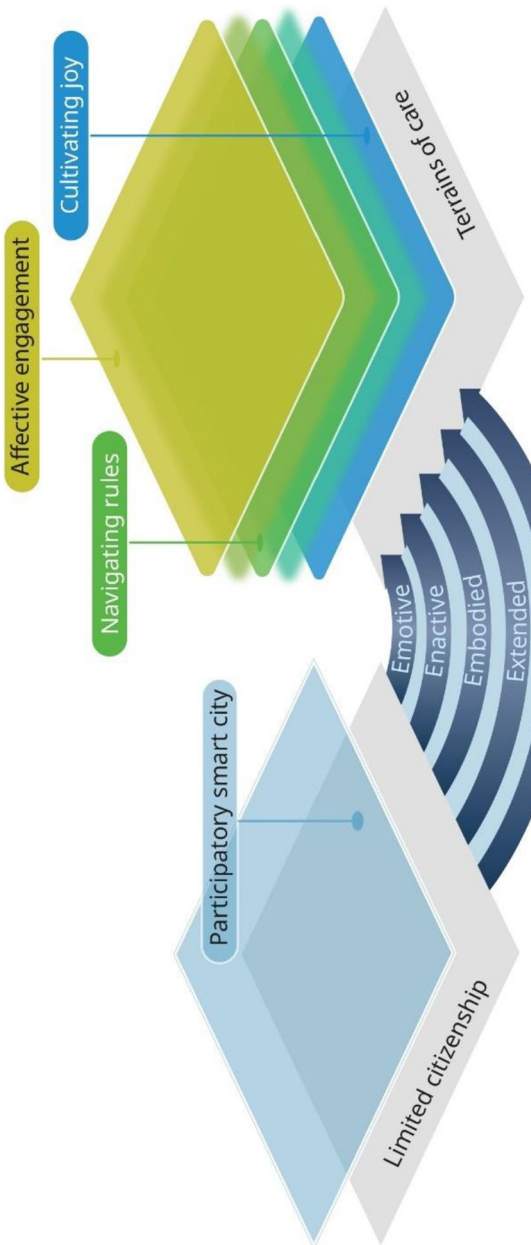

Fig. 1 Terrains of care, in which diverse care practices by creative communities of practice bring complexity to citizenship in the smart city. These overlapping terrains of care are linked, constraining and enabling enactive sensemaking. In contributing to smart citizenship, 5E sensemaking practices are not separable and distinct, but work together as part of a whole, bringing light to care practices in the smart city

enact care to look after small-scale spaces that they felt were forgotten, neglected, or at-risk in the urban landscape, repurposing those spaces to maintain culture hubs. This emerged as a politics to memory and forgetting in spaces, in which organizers care non-neutrally, opening tensions between "work, affective engagement, and ethico-political involvement" (Puig de la Bellacasa 2017). Organizers working in repurposed or rental spaces, especially in central Helsinki and neighborhoods slated for restoration, reveal the emotive nature of their work in the possibility of losing future collective space to private business. They describe those spaces are deserving of attention, setting themselves with the task of keeping certain spaces alive that will not be managed by anyone else.

[On finding their current space, a former collective art gallery]

> *"We felt that we wanted to somehow save the space [...] We have been critical against... art galleries becoming showrooms. So out of a whim we said let's try to get it. So it was a way to salvage this space, we wanted to keep public space in the city." -O6.*

[On their operations in Pasila]

> *"It's a bit of a forgotten area... that's why I wanted to operate here" -O10.*

Organizers also shared how their affective engagement with at-risk spaces is a constant commitment to work with often limited funding that can put their well-being and passion at risk (O7, AO8), creating an administrative and emotional burden that at times forces their activities into different places within Helsinki, or other cities (AO8, O10). These affective tensions and contestations remain invisible in a smart city context, where attention is often directed towards the potentialities of the new (Zaman and Hertweck 2022). The memories of what a space used to be, and the erosion of public spaces, motivates them to take responsibility for their maintenance (Till 2012). We are reminded of Graham and Thrift's (2007) surfacing of invisible work; in surfacing invisible care, we illuminate the activities that enliven smart urban space.

The ambivalent nature of affective engagement is not limited to organizers. One urban planner and longtime resident of the city described their memories of central Helsinki, linking this emotional recollection with their current motivation in an example of professional intimacy. U4's reflection allows us to see the impact of embodied memories on their normative planning views.

> *"I have a few places where I used to go, I knew that I could be alone there. If I wanted to just reorganize my brain, I went there. There are certain places by the railway line where you can smell the logs under the rails, that used to have a certain chemical which is now banned, but still have the smell... Industrial places should not always be pushed outwards from the center." -U4.*

Care exists in both spatial and temporal terrains of the city, and emotive sensemaking is therefore inextricably linked to both place-based memories and desired futures (Feola et al. 2023). This is also true for urban planners, who grapple to various degrees with the conflicting natures of smart urban growth goals, their own emotive sensemaking about what should be preserved (U4, U5, U13, U15), and that of others (Laurian and Inch 2019). This finding resonates with sense of place scholarship calling for greater

recognition of sensory perceptions in place meaning (Raymond et al. 2017). A smart city that embraces residents' urban memories as part of their practices may better understand complex affective relations, as these are not processes solely confined to the mind but are present in the making of a smart urban environment (Brinkmann and Kofod 2018).

Navigating institutional rules and social expectations

On a groundwork of affective engagement, communities of practice also navigate institutional rules and social expectations (and encounter how others navigate and engage) in the smart city. These navigations are mediated by sometimes real, sometimes perceived barriers to use of space and possibilities for action, surfacing extended, embodied, and enactive sensemaking processes (Table 1). These real and perceived barriers both constrict and enable the ways that care can be enacted. While Lefebvre identified this as a social alienation linked to homogenized, consumer-centric spaces (1992), these alienations also manifest as reinforcements between the "official world from that of ordinary people" (Herzfeld 2020). Importantly, in these examples, we observed cases of barriers directing participants ability to 'care for', leading them to sometimes adapt acts of vital maintenance or affectivity necessary for caring relations (Puig de la Bellacasa 2017). For example, urban planners have varied expectations of what accessibility looks like for the public and are sometimes confronted with cultural realities conflicting with the aims of their work. Similarly, some are reckoning with the economic realities of a growing smart city placing emphasis on new spaces, rather than allowing old buildings to be turned for public use and care. Below, U16 and OU18 reflect on the limitations of their practice, even as they work to support public and creative use of urban space.

> *"For example, this one woman came to me on the square, and said 'it's so nice to have these places to sit and more green. I've been wondering for a long time if I could hold a meeting on the square.' But she didn't know whether she needs permission! So you don't know what you can do, what you're allowed to do in urban space. And I think the Finnish culture hasn't really supported the loitering around or lingering around, because it's looked down upon almost…" -U16.*

[On opening flexible spaces for creative work]

> *"I do know that space is a really good resource for people, but it tends to be forgotten in many cases, especially in the social side. There are so many spaces around the city to which you don't have access, or there is some kind of barrier there. But instead of building all the time new… somehow seeing the existing things, and somehow releasing that resource." -OU18.*

In these examples, the act of care is constrained and directed by extended realities, including Finnish culture and expectations for use of public spaces. OU18 recognizes barriers to access used urban space as opportunities to prevent the homogenization of old space and give these spaces back to creatives. On the other hand, cultural barriers can lead to differing understandings of how much leeway city residents have to take ownership of space. One urban planner expressed concerns about the problematic role that Finnish culture plays in encouraging a practice of permission seeking to use public

space (U16), and the reinforcing expectation that stems from reserving city spaces via an online system. Later, they described how this affected their ideas about spontaneity and lively use of space. In contrast, another urban planner took the view that if an outdoor urban space is available, it can be used without city input (U11).

Navigation around perceived and real societal rules creates and limits the possibilities for care in different spaces. For example, the COVID-19 pandemic played a role in stifling and (re)directing the enactment of care. One organizer reflected on their work during COVID: while social distancing forced them to limit in-person audiences, they brought their efforts online to persist through social distancing regulations. Now that social distancing policies have ended, online engagement still plays a major role in their work, and they aim to continue hosting both in-person and online communities (O7). Another artist-organizer reflected on their experiences with sharing their work under constrained funding. Through presenting their art in a public forest, they were able to make new connections with their audience, which would not have been possible in a traditional gallery space.

> *"I was quite frustrated about the whole process of applying for a gallery space, and then applying for the money to make it happen. I just wanted to do something and present my work, so I had this idea of organizing an art exhibition in a forest in Helsinki. [...] It was held in the Kruunuvuori forest with maybe ten-ish artists. What first was just an act of frustration and this hope of showing your work to someone later came into this whole project, because I realized that presenting art in a nature environment gives it a whole different layer. It was only one day, but during that the feedback from visitors was on a whole different level. People were really talking with the artists and experiencing the art, and there was lots of dog walkers who just happened to be there, and I felt like there I could achieve this real connection..."-AO8*

Based on their experiences organizing spaces from the bottom-up, navigation of institutional barriers prompted some artist-organizers to (when feasible) reject commercial spaces when they felt frustrated by the process of applying for gallery space (AO8, AO20*, AO21*). The professional intimacy of these communities of practice therefore at times directs how they navigate barriers between society and practice, indicating that care is indeed situated, and necessarily contextually constrained (Puig de la Bellacasa 2017). For example, while there is a need for a certain degree of detachment in urban planning, this exists in synchrony with how some urban planners experience the city as individuals. One urban planner decisively frame their experiential knowledge about the city, but also aims to keep their professional and personal identities distinctly separated (U11). Another urban planner reflected on the complicated nature of the role they play in the city, and the conflicts they observe between their working and personal lives (U16). This highlights how these communities of practice are in constant negotiation with the localized rules of their institutions, embodying relationships with their surroundings, and at times deciding to embed themselves consciously in the discourses of their professions (Herzfeld 2020).

> *"Yeah, I've actually studied here in Helsinki, in Espoo, etc. I know like my own pockets all the corners and areas in Helsinki. I do."*

[Later]

"I guess that's the professionalism that you need to kind of teach yourself when you are in strategic planning level. We've had difficulties of people sticking too much into detail, and you need to be really careful when you start working on regional and metropolitan, city regional level [...] It's not really up to you to cope with or deal with [persona connections to place], so keeping your mindset focused on the strategic level." -U11.

"This is what I actually battle with myself a lot is that, while I'm working towards decreasing segregation in Helsinki, I'm kind of creating it myself. Because I choose to live in an area where I know there's good schools for my kids. You know it's close to lovely nature and sufficient services that I can utilize. And then if you look at for example eastern Helsinki, beautiful nature, absolutely amazing. But the schools are not good. So you have to make these choices." -U16.

Several artist-organizers, who all indicated that they were not from Helsinki, brought up notions of interdependency, alienation, and the influence of the individual that stemmed from the consumer-centric culture of Helsinki. One echoed the sentiment of U16, saying though their life had improved since arriving in Finland, they had trouble separating their personal comfort from inequalities experienced in their home country, and the global patterns of resource extractivism necessary to maintain those improvements (AO9). Another reflected that though they were able to be a more authentic version of themselves in Helsinki, this came at the expense of a consumer-centric sameness seemingly required to be a "citizen" in the city (AO22). A third commented that middle-class consumerism is not a part of the urban culture to which they have access (AO8). Because of this feeling, AO8's frustration drew them to the potentials of creating a temporary outdoor public gallery space. The example of consumer-centrism as alienating one from the conditions of a meaningful life is not new. However, the artist-organizers above have found ways to work with these constraints create caring relationships within these perceived constraints by engaging with community members and non-human surroundings. It is apparent that there are still individual- and community level interpretations of care practices operating alongside institutional drivers of smart urban life.

In recognizing the constraints and possibilities for navigating social rules and expectations, we suggest it may be possible to frame possibilities for smart city institutions that give room for the complexities of sensemaking through care. The diversity of navigations within and between communities of practice should not be disregarded, but further examined as sites of intra-active becoming (Barad 2007). We find that creative communities of practice are not simply limited in their enaction of care, but also enabled and redirected.

Cultivating joyful experiences and inspiration

Urban planners, organizers, and artists acknowledged the spaces and infrastructures where they are able to create and experience joy through emotive and embedded sensemaking processes (Table 1). While smart city infrastructure can create efficiency affordances for residents, aspects such as spontaneity, surprise, discovery, and unexpected

encounters are difficult to find, or must be created in often ephemeral, ineffable ways. We suggest that this third terrain of care is based on the creation of these encounters, and the pleasure that is derived from creating joyful experiences for and with others. Puig de la Bellacasa describes these experiences as being "drawn to" caring relationships, an immanent obligation that does not occur by choice, but instead through "collective doings that enacted an ethics and by continuously cultivating this experienced obligation as joy" (2017:159). This section describes the joys that grow from "knowing-in-connection" (De Jaegher 2021), which amount to caring, even loving relations between people and smart urban spaces.

> *"Where is the joy? If it functions you don't really notice it, you might not be stressed all the time... but is that joyful life if everything runs smoothly? Part of cities being cities is that unexpected things happen."-U13*

This notion was brought up directly by U13, who reflected on Helsinki's goals for a functional smart city. Contrasting with the logic of smartness, another urban planner expressed that a smart city should be functional so that "everything goes smoothly, and you don't even realize it" (U14), sentiments that were echoed by nearly all participants who acknowledged that public transportation in Helsinki is generally smooth. However, the expectations of what smartness should be run counter to the desires and experiences of some organizers. Some reflected on the philosophy of a functional Helsinki and its relationship with their activism. One was quite explicit in the goals for their community space and stated that creative ideas happened in places that were "unfunctional" (O6). Another found that their ability to facilitate community participation initiatives was limited by functionalist urban planning goals (O10). These thoughts emphasize a tension ignored by smart city initiatives, which prioritize smoothness without taking into consideration some generative urban frictions.

> *"There are some parks in suburban areas like Roihuvuori... They have planted cherry trees, and they become completely crazy about it... it goes wrong every year, you never know when they will bloom."-U15*

[On their street window display]

> *"You go about your business, glance back... some decide this is not for me, or just stand there and reflect on it... This particular text has been really interesting for kids. There's a couple of kids who want their parents to read certain words each morning. You can hear them when they walk by: "Read! Read!" There's words like pizza and candy and Christmas and ice cream and metro..."-AO20**

When discussing spaces that were at risk due to densification, U15 spoke to a need to balance green and built areas. In their answer, they pointed to an example of an at-risk green space that demonstrates the value of some lack of predictability interwoven in the smart urban landscape. This again contrasts the analogical relationship between stress:inefficiency and joy:care, and re-emphasizes how some urban planners recognize that a joyful city can occur, even when things "go wrong" (i.e., are not completely functional). Other at-risk spaces mentioned by interviewees were street-level shops. For example, AO20* had collaborated in lending their studio's window space to a series of

temporary text-based art exhibitions. Their thoughts on seeing mixed-generation passers-by engage with their display highlight the transcendent nature of cultivating joy: tenuous, temporary experiences. The feelings behind these thoughts emerge as a need to be available to serendipitous moments (as mentioned by AO1), and point to an openness to chance encounters (De Jaegher 2021).

[On how space mediates their zine publication]

> *"Not physical space, I think it's something fluid like some sort of fire that follows us everywhere. There's that serendipity kind of aspect to it. This is why artists need these creative spaces to do nothing or do everything, just have time to just be. It's in these moments that ideas come out, an idea, a proposal, a plan, or something. Invitation. Rejection… Different spaces inspire different aspects." -AO1.*

> *"I find myself mostly bored in Helsinki. It's good and bad. It pushes me to do something… you have to spend a lot of energy to push yourself." -A2.*

> *"I perform better when I don't push myself, when I let myself be… I can be more conscious of whatever happens around me without labelling it as a distraction." -A12.*

We have so far spoken to the fluid and contextual nature of care, the ethical relations found while testing the boundaries between functionality and joy, and how these principles can occur in the same smart city. While one urban planner may care for residents' well-being through functional smart urban planning, a certain individual artist may enact care by slowing down passers-by and getting them to engage with something unexpected. Yet joyful experiences are not the sole enterprise of the interviewees. We uncovered indications of a more diverse "ecosystem" from which other emotive and enactive experiences can be cultivated. In our interviews, this appears in the influence of boredom and inspiration. Contrary to U13's quote, it seems that smooth living does not necessarily correlate with a meaningless smart city. For example, AO1 suggests that spaces to enact care are useful for cultivating diverse creative experiences, including managing rejected proposals. Some artists and organizers reflected on their embodied and emotive relationships to boredom and distraction in the city, and the affordances these relationships grant them to enact their practice. A2 and A12 appeared to work within these moments to find inspiration or innovation, and shelter from the pressures of "wasting time". This aspect of care reveals a different interpretation of smoothness and ease in the smart city, where creative inspiration emerges from quotidian parts of daily life. In these cases, care also seems to mean that a smooth, boring smart urban life can push one to be more present. These examples require us to reexamine some perceived risks of mundane efficiencies of modern smart cities in a context where boredom is a precursor to possibility (Gamsby 2018), alongside a new appreciation of slowness as a part of the materialization of smart cities (Anderson 2004).

Conclusion

In this article, we have applied an enactivist lens and 5E sensemaking processes to understand the role of care in how creative communities of practice help shape a meaningful smart city. Based on in-depth interviews with these creative communities of practice, we

described terrains of care practices that bring forth meaningful relations through non-neutral citizenship. Through this lens, we have seen myriad caring forms of the smart city which congeal when ethico-onto-epistemological relations are taken as a starting point.

This work takes an empirical approach to embodied understandings of what can make cities both smart and meaningful to live in. We highlight the importance of understanding what creative communities of practice in a smart city actually do in their professional spheres (Williams 2017), and the usefulness of taking an embodied, enactivist approach to point to the transformative potential of these practices. This enactivist expansion of the smart city suggests that knowing, being, and practices are inextricable from claims to smart urban space and widens understandings of the smart city beyond participatory citizenship. We suggest that future smart city research give attention to this relational understanding of smart urban practices, to better grasp transformative citizenship practices in urban spaces. This is especially important considering our findings around the relationships between professional intimacies and institutional complexities, and the diverse paces of urban life required for creative communities of practice to flourish.

We recognize the limitations of our focus on one smart city case and creative communities of practice, and the difficulties in applying these findings to other sites. However, we encourage further research on the complexities within case studies, as an emphasis on comparative studies will necessarily prioritize findings of differences and similarities across cities over the nuances within one site. Additionally, enactivist modes of analysis should be further explored to better understand the complex relations between cognition and experience in the smart city.

While this article explores care practices in the smart city, our research should not be interpreted as a call for structural changes to the smart city paradigm, nor should terrains of care be lifted or formulated as a pure and impartial framework to reimagine the smart city (Murphy 2015). Shifting attention to care cannot be regarded as, for example, a solution to the limitations of participatory smart cities. Rather, in using enactivism to focus on care in creative communities of practice, we were able to highlight for future research those unseen assumptions of what citizenship practices can look like in smart cities. Therefore, this research depicts already existing terrains of care in a smart city in progress, which cannot be artificially created and superimposed in other cities, smart or otherwise. These terrains are not always positive, but are contested and situated, and are inseparable the web of care where we can bring forth a world of meaning (Puig de la Bellacasa 2017; Di Paolo and De Jaegher 2022). Future research on smart cities may benefit from continued work on how smart city governance can begin to recognize these caring forms of citizenship practices.

In this sense, embodiment can deepen smart urban planning to acknowledge its creative complexities. Our contributing claim is therefore a nudge closer to a care perspective that shows citizens as very much present, often in conflicting ways, in creating the realities of the smart city, rather than perpetuating the concept of an "absent" smart citizen (Shelton and Lodato 2019), even when their activities are not labelled as smart through prevailing academic lenses. The 5E approach used in this study is a beginning to such an exploration into research that humanizes communities of practice in smart cities as participants in shared becomings.

Supplementary Information

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Supplementary Material 1.

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Authors' contributions
SZ conceived of the presented research question, collected the data, performed the analysis and interpretation of results, and led the writing of the final manuscript. SN contributed to the analytical framework and writing the final manuscript. CR supervised the project, helped develop the theoretical output, and contributed to writing the final manuscript. All authors reviewed the results and approved the final version of the manuscript.

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Data availability
Respecting privacy agreement between researchers and participants, data will not be shared.

Declarations

Competing interests
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