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From the smart city to urban justice in a digital age

Marit Rosol  and Gwendolyn Blue 

The smart city is the most emblematic contemporary expression of the fusion of urbanism and digital technologies. Critical urban scholars are now increasingly likely to highlight the injustices that are created and exacerbated by emerging smart city initiatives and to diagnose the way that these projects remake urban space and urban policy in unjust ways. Despite this, there has not yet been a comprehensive and systematic analysis of the concept of justice in the smart city literature. To fill this gap and strengthen the smart city critique, we draw on the tripartite approach to justice developed by philosopher Nancy Fraser, which is focused on redistribution, recognition, and representation. We use this framework to outline key themes and identify gaps in existing critiques of the smart city, and to emphasize the importance of transformational approaches to justice that take shifts in governance seriously. In reformulating and expanding the existing critiques of the smart city, we argue for shifting the discussion away from the smart city as such. Rather than searching for an alternative smart city, we argue that critical scholars should focus on broader questions of urban justice in a digital age.

Keywords **justice, smart city, Nancy Fraser, digitization**

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Introduction

We live in an age where digitization, digital networks, big data, and internet-based infrastructures are 'mediating and augmenting the production of space' and in so doing, are 'transforming socio-spatial relations' (Ash, Kitchin, and Leszczynski 2018, 29). The smart city is an emblematic expression of these transformations where data, sensors, and algorithms are presented as technical solutions for urban problems. After initially being dominated by affirmative perspectives, since about 2014 an increasing number of critical views on the smart city have been published by geographers and urban scholars (amongst by now many others, see Cardullo and Kitchin 2019; Cugurullo 2018; Greenfield 2013; Hollands 2008, 2015; Kitchin 2016; Leszczynski 2016; Rose 2020; Söderström, Paasche, and Klauser 2014; Wiig and Wyly 2016), with some of the earliest and most cited critiques being published precisely in this journal (Hollands 2008; Söderström, Paasche, and Klauser 2014).

Most of these critiques directly or indirectly invoke questions of justice; however, they rarely define its meaning. Consequently, the meaning of justice in critical smart city debates remains elusive and theoretically underdeveloped. This is despite the fact that critical urban geographers have of course long engaged with concepts of social justice, from Lefebvre's (2003 [1970]) call for the right to the city, further developed for example by Marcuse et al. (2009) and Brenner, Marcuse, and Mayer (2009), to questions of spatial justice (Soja 2010; Marcuse 2009; Fainstein 2009), to Harvey's (1973) seminal work on justice and the city, to interventions like Fainstein (2010) which highlight the importance of participatory engagement to expand understandings of urban justice (for an overview on some of them with reference to the smart city see Kitchin, Cardullo, and Di Feliciano 2019; for an application of David Harvey's social justice theory on questions of the smart city see Vanolo 2019).

This article starts from the premise that the ways in which justice is defined in academic debates about smart cities is consequential, as our collective ability to respond to justice claims is conditioned by the very concepts used to recognize and redress injustice (Barkan and Pulido 2017). To harness the rather abstract notion of justice for a smart city critique with the view to strengthen this critique, in this paper, we employ Nancy Fraser's conceptual model of justice. Even though her theory of justice was not explicitly formulated for urban questions, Fraser's approach is, in our view, particularly helpful for understanding social justice in the smart city as it is well developed, comprehensive, and systematic.

Fraser's expansive approach combines three interdependent yet distinct dimensions of justice that together ensure parity of participation. We can identify each of these dimensions individually in the critical smart cities literature (see section 'Justice in critical literature on smart cities') but they have yet to be brought together systematically. The three dimensions are: redistribution (put simply: who gets what), recognition (who is included and heard), and representation (how do we decide who gets what and where does this decision-making take place). Although Fraser separates these dimensions for analytic purposes, they are connected: redistribution is the acknowledgment and remedy for economic inequality, recognition for a failure to treat all social

groups as equivalent, and representation for a failure to ensure due process across multiple scales. Fraser thus goes beyond theories of justice that examine questions of material redistribution, cultural recognition, and political representation separately; as she emphasizes, there is: '[N]o redistribution or recognition without representation' (Fraser 2005, 85f.) A critique based on Fraser's theory of justice thus enables a comprehensive and nuanced engagement with the uneven ways in which rights, responsibilities, duties, capacities, and opportunities are experienced across existing urban contexts in which digitization, digital networks, and internet-based infrastructures are increasingly dominant and presented as an important goal of urban development and inherent public good.

Following on from Fraser, our contribution to the burgeoning critical smart cities literature is three-fold: First, we provide a heuristic framework for justice organized along the domains of redistribution, recognition, and representation. Second, we outline key themes and identify gaps in existing smart city critiques and discuss implications. Third, we demonstrate that some critical efforts to enhance justice, for example through 'bottom up' interventions to resist corporate interests or through rights-based frameworks, while important, are insufficient. Recognizing these limitations, we argue for *transformative* approaches to justice in which efforts are directed towards imagining and implementing a just city based on principles of parity of participation. This involves a *distributive* dimension oriented towards overcoming economic inequalities through control over structural and spatial processes, a *recognition* dimension oriented towards dismantling the status hierarchies that contribute to vulnerabilities and inequities, and a *representation* dimension oriented towards enabling opportunities for participation and, importantly, for reframing the 'stage on which struggles over distribution and recognition are played out' (Fraser 2013, 195).

After providing the conceptual framework in the next section, in the third section we reformulate and expand the existing critiques of the smart city using Fraser's tripartite framework of justice, organized along the domains of redistribution, recognition, and representation. In the fourth section we briefly discuss (and reject) calls and ideas for 'alternative smart cities'. Instead, we call for continued conceptual analysis, policy interventions, and social struggles guided by Fraser's theoretical insights, namely an ideal of justice based on parity of participation, to further urban social justice in a digital age. In the same section, to illustrate what this entails in practice, we briefly review current developments around the notion of technological sovereignty, which in our view can be strengthened by deploying the conceptual insights Fraser provides. We conclude with highlighting the advantages of employing Fraser's approach for the smart city critique while also pointing out limitations.

Our aim is not to attempt to fix the meaning of justice. Such meanings will invariably change through collective efforts to understand and change material and discursive conditions. Further, we recognize from the outset that this discussion of justice is situated and partial, informed by our own particular experiences and social locations. This review mainly engages English language critical urban literature and is biased toward examples from European and North American smart cities. With these limitations in mind, our objective

with this conceptual intervention is to affirm the importance of comprehensive and open-ended conceptions of justice to facilitate progressive horizons of possibility in a digital age. Our hope is that this intervention will provide a base for further empirical investigations into justice in our increasingly digitized and networked urban societies which extend beyond Western perspectives.

Nancy Fraser's conceptualization of justice

Justice as parity of participation

An internationally recognized philosopher, with her work, Nancy Fraser has contributed to both feminist theory as well as critical analysis of capitalism. Fraser emphasizes that struggles for justice must be fought on three terrains—economic, cultural, political—to ensure the principle of *parity of participation*, i.e. 'social arrangements that permit all (adult) members of society to interact with one another as peers' (Fraser 2013, 164; see Figure 1). In her initial work on justice, partly in response to Young (1990) who rightly criticized the prevailing reduction of social justice to redistributive justice which often excludes people not culturally identified with white Western male norms and who urged scholars to take group-based oppression into account, Fraser sought to overcome what she called the redistribution-recognition dilemma (Fraser 1995, 1997a, 1997b), where two dominant paradigms of justice—redistribution of resources and recognition of identity claims—'do not communicate' (1997b, 127). Fraser defined *redistribution* as the socio-economic dimensions of justice in terms of allocations of wealth, resources, labour, and opportunity. More specifically, she drew attention to the 'social arrangements that institutionalize deprivation, exploitation, and gross disparities of wealth, income, and leisure time, thereby denying some people the means and opportunities to interact with others as peers' (Fraser 2013, 164).

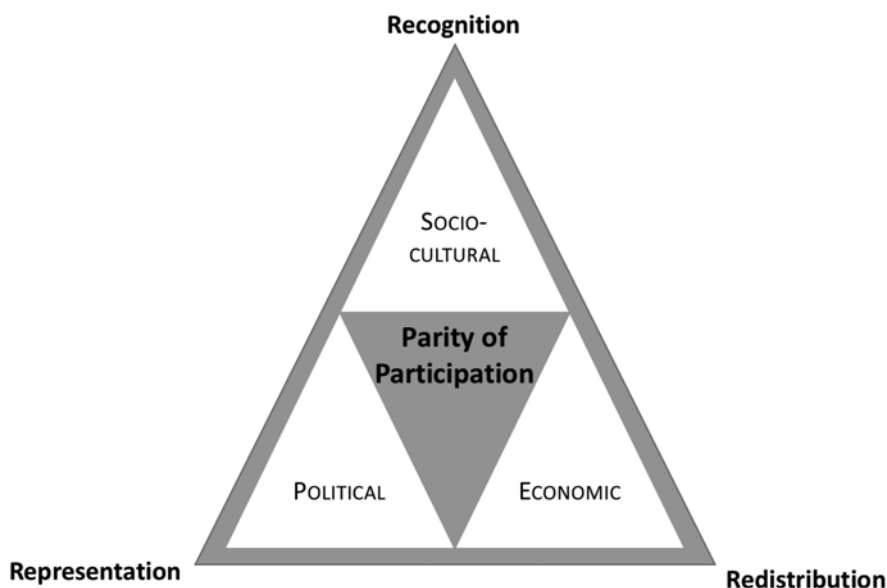


Figure 1: The Parity of Participation (authors' visualization of Fraser's justice model).

Whereas redistribution examines and highlights the barriers to participation parity associated with economic inequities, *recognition* directs attention toward the institutionalized patterns, structures, and policies that produce and sustain inequities of social status. Although recognition is related to cultural difference and identity, in Fraser's understanding it entails social struggles aimed towards overcoming structural dimensions of subordination. Attention to recognition as a dimension of justice is an acknowledgment of status inequality including race, gender, sexuality, and other axes of social differentiation (Derickson 2016). Failure to recognize differences among and within groups risks perpetuating injustice. *Misrecognition* is a form of injustice that occurs when the views of certain social groups are ignored, devalued, or distorted. Examples of misrecognition include

cultural domination (being subjected to patterns of interpretation and communication that are associated with another culture and are alien and/or hostile to one's own); *nonrecognition* (being rendered invisible by means of the authoritative representational, communicative, and interpretative practices of one's culture); and *disrespect* (being routinely maligned or disparaged in stereotypic public cultural representations and/or in everyday life interactions). (Fraser 1995, 71, emphasis added)

In her later work, Fraser added the political dimension of *representation*, in which she acknowledged that in an increasingly interconnected and globalized world, 'it is no longer axiomatic that the modern nation-state is appropriate for thinking about justice' (Fraser 2013, 191). This dimension of justice is simultaneously political and spatial, centred around questions about 'who is included and who [is] excluded from the circle of those entitled to a just distribution and reciprocal recognition' (Fraser 2013, 195). Representation refers to the political procedures, processes, meanings, and contexts that structure and enable redistribution and recognition. *Misrepresentation* is a form of injustice that occurs 'when political boundaries and/or decision rules function to wrongly deny some people the possibility of participating on a par with others in social interaction—including, but not only, in political arenas' (Fraser 2013, 196).

Fraser identified three different types of misrepresentation. *Ordinary-political* misrepresentation refers to procedural injustices, such as when people are denied the chance to participate in the decisions that affect their lives (Fraser 2013, 196). By contrast, *misframing* refers to metapolitical injustices that occur when a politics' boundaries are 'drawn in such a way as to wrongly deny some people the chance to participate at all in its authorized contests over justice' (Fraser 2013, 196–197), which results in the wrong exclusion of some people, denying them the chance to press justice claims. Fraser's third level of representation—the *process of frame-setting*—refers to the shifting terrain on which political participation and justice deliberations takes shape in a globalizing world. Since the 1980s, far-reaching socio-economic and political changes have altered the conditions of participation in social life. In particular, the nation-state's ability to provide employment, prosperity, and social balance in a Fordist-Keynesian manner has declined considerably as decision-making power has been re-scaled (Brenner 2004).

According to Fraser, both claims for redistribution as well as for recognition implicitly assumed the territorial nation state as the appropriate terrain and also struggles around ordinary-political representation are usually played out in the Keynesian-Westphalian frame. However, in times of a globalized and integrated economy, of increasing power of supranational governance bodies and of transnational corporations, a Keynesian-Westphalian frame of the nation state ‘effectively exclud(es) transnational democratic decision-making on issues of justice’ (Fraser 2013, 198). This means that in a globalizing world, an adequate politics of representation and to remedy injustices resulting from misrepresentation and misframing must also democratize the process of frame-setting as well as extending, including geographically, the frame itself (Fraser 2013, 200).

According to Fraser, social justice cannot be reduced to any single dimension, but necessarily encompasses all three—i.e. redistribution, recognition, and representation. This also means that there is no hierarchy between the three dimensions. As such, remedies to address one dimension of injustice must necessarily extend to the others. The underlying norm of participation parity connects these domains; in short, any injustice arising from maldistribution, misrecognition, or misrepresentation limits an individual’s ability to participate as a full member of society.

We summarize the three dimensions of justice in the following table (see Table 1), supplementing definition of injustices in each realm with possible strategies for action.

Table 1: Summary table of Fraser’s justice model (authors, based on Fraser 2013).

Dimension	Injustices	Strategies for action
Redistribution (Economic)	‘social arrangements that institutionalize deprivation, exploitation, and gross disparities of wealth, income, and leisure time’ (Fraser 2013, 164)	Reduce and ideally prevent exploitation, marginalization, deprivation, redistribute economic resources; favour low-income groups and marginalized communities
Recognition (Cultural)	‘institutionalized hierarchies of cultural value that deny (certain groups) the requisite standing’ (Fraser 2013, 193)	Address, limit and ideally prevent domination, non-recognition, misrecognition, devaluation, disrespect, work to overcome subordination by establishing groups rendered inferior as full members of society, capable of participating as peers
Representation (Political)	‘exclusion from the community of those entitled to make justice claims to one another’ (Fraser 2013, 195)	<i>Ordinary-political representation:</i> ensure fairness, transparency, legitimacy, inclusion <i>Framing:</i> broaden participation in defining policy agendas by acknowledging diverse worldviews and forms of cognitive authority, allowing re-framing of issues <i>Frame-Setting:</i> democratize the process of frame-setting in a globalizing world; recognize and address shifting configurations of power within and beyond nation-state

Fraser also provides some guidelines for dealing with conflicts that emerge between dimensions of justice. For any given participatory situation, the challenge for remedial action is to determine which dimension applies for which social collective. For instance, members of some groups—such as working class white males—may experience economic injustice but not necessarily cultural misrecognition or political misrepresentation. Other groups—such as working class women of color—may face cultural discrimination and lack of political representation on top of economic inequality. To ensure parity of participation, those who experience multiple forms of injustice may require distinct forms of remedial efforts such as positive recognition of identity, equitable redistribution of wealth, and proper procedures to ensure their views are accounted for in collective decision-making.

Furthermore, if claims for recognition of minority cultural practices conflict with gender equity, for example, the principle of participatory parity has to be applied twice:

Claimants must show, first, that the institutionalization of majority cultural norms denies them participatory parity and, second, that the practices whose recognition they seek do not themselves deny participatory parity to others, as well as to some of their own members. (Fraser 2013, 169).

Equally, remedies to overcome distributional injustices or misrecognition also need to both ensure procedural justice and acknowledge the politics of framing to show that people are not excluded through lack of representation or misrepresentation. The ways in which injustices are addressed and resolved in practice will depend on a clear analysis of the unique configuration of social relations in each specific situation.

Affirmative versus transformative remedies for injustices

Important for our discussion on justice in our increasingly digital (urban) world, Fraser distinguishes between affirmative versus transformative remedies for injustices. By *affirmative*, she means 'remedies aimed at correcting inequitable outcomes of social arrangements without disturbing the underlying framework that generates them' (Fraser 1995, 82). Going further, Fraser proposes *transformative* approaches 'aimed at correcting inequitable outcomes precisely by restructuring the underlying generative framework' (Fraser 1995, 82), i.e. transforming the status-quo.

Returning to the three dimensions of justice (see Table 1), Fraser described affirmative *distributive* remedies as those that seek to correct existing income inequalities by facilitating the transfer of goods to marginalized groups. These strategies tend to leave unaddressed, and hence intact, the conditions responsible for generating economic inequality, such as capitalist modes of production. Transformative measures for addressing distributive injustices move beyond the transfer of material goods to address the root causes of distributive injustice (Fraser 1997a).

Affirmative remedies for *recognition*-related injustices seek 'to redress disrespect by revaluing unjustly devalued group identities, while leaving intact both the contents of those identities and the group differentiations that underlie

them' (Fraser 1995, 82). Transformative remedies, by contrast, recognize the fluid and dynamic nature of collective identity and seek to transform the underlying social structures that position some groups as more worthy than others in any given situation.

Misrepresentation can be resolved by affirmative strategies such as those that protect political rights to participation and to access to information. Addressing injustices associated with mis-framing, however, requires transformative remedies that recognize and seek to redress the fluid, dynamic, and spatial nature of politics and governance, particularly in contexts where governments increasingly rely on corporations to provide public services.

Justice in critical literature on smart cities

Using Fraser's tripartite approach to justice outlined in the previous section, in this section we examine how justice is addressed in critical geography literature on smart city initiatives. While a detailed review of smart city developments is beyond the scope of this paper (for this, see recent anthologies such as Bauriedl and Strüver 2018; Cardullo, Di Felicianantonio, and Kitchin 2019; Karvonen, Cugurullo, and Caprotti 2018; Marvin, Luque-Ayala, and McFarlane 2015; Willis and Aurigi 2020; see for a summary of the debate as well as several brief case studies also Morozov and Bria 2018), we define the smart city as encompassing twinned patterns of urbanization and digitization which converge in a mediated, networked, data- and algorithm-driven mode of urban planning on a global scale, albeit in geographically specific ways.

Redistribution

While critical research examines a range of social dimensions of digitization, many of the critiques of the smart city, especially the early ones, are rooted in political economic perspectives and center on questions related to redistributive dimensions of justice such as who collects, owns, and controls access to data and digital technologies as well as who profits and who pays. Hollands, for example, criticizes smart city programmes as generally 'technologically led, corporately influenced and tied to competitive models of the entrepreneurial city [...] undertaken by city governments for urban marketing/ branding purposes' (Hollands 2015, 70). Many critics see the smart city as a tool of transnational technology corporations to maximize their profits. The aim of these companies is to create and expand markets and to make cities dependent on their equipment and knowledge for managing them, effectively establishing themselves as monopolists (Rauth 2015; Söderström, Paasche, and Klauser 2014; Datta 2015; Kitchin 2014; Viitanen and Kingston 2014). The smart city is seen as exemplifying a broader shift in the economy towards a cognitive-cultural capitalism¹ (Söderström, Paasche, and Klauser 2014, 308; see also Wily 2013; Scott 2011), which can be understood as a search for a new 'spatial fix' (Harvey 2001) in times of increasingly difficult accumulation strategies (Hollands 2008). They point out that it is probably no coincidence that smart city developments gained momentum after the 2008 global financial crash (see also Sadowski 2020). Critics remind us further that

such an accumulation strategy was enabled by the privatization of national telecommunication systems (Hollands 2015).

Importantly, urban political economy dynamics based on the increasing reliance of digital technology continue to evolve—and questions of justice need to be readjusted to these new configurations of power, technology, and capital. Sadowski (2020) provides an acute analysis and framework to keep track of these different forms of the urbanization of technology capital. He distinguishes three different developments that evolved subsequently but—importantly—without replacing the previous. Specifically, he identifies an initial phase which is most closely associated with the smart city. Here, major global technology firms like IBM, Cisco or Siemens, tried to sell their systems (equipment and services that are digitally-enabled, data-driven, network-connected, and automated) to city governments to address a range of urban problems (e.g. by installing sensors for real-time analytics and algorithmic management of traffic).

Subsequently, we have seen the evolution of two different and no less important phases, led by new actors with different accumulation strategies, that are not fully captured within the smart city terminology. The second phase refers to—often venture-capital backed—digital platforms that are increasingly transforming the way urban residents move, live, eat, travel, and connect, with Uber and AirBnB as the best known and most powerful examples. Technology and capital are no longer addressing city governments and administrations, but sell their services directly to city inhabitants, exploiting gig labour and regulatory gaps. After the ‘smart-city’ or ‘smart-urbanism’ phase, Sadowski (2020) calls this the ‘platform-urbanism-phase’ (for the term Platform Urbanism see Rodgers and Moore 2018 and further contributions in the same issue; Leszczynski 2020; Rose et al. 2021; Murakami Wood and Mackinnon 2019 and further articles in the same issue; see also Srnicek 2016).

In the latest phase, by merging tech with real estate capital—with the (failed) Google Sidewalk Lab development in Toronto as the most emblematic example and first test-bed case (Artyushina 2020; Mann et al. 2020)—giant tech firms specializing in data extractivism are now aspiring to taking over and owning entire parts of the city. As Morozov and Bria (2018, 18) explain, such a strategy may be attractive for cash-strapped cities under austerity regimes, as they do not have to pay for services in cash but basically pay with data of their citizens. They point to the important connection of the imperatives of ‘smartness’ with austerity urbanism (Peck 2012). The combination of owning buildings, physical and other infrastructure (i.e. the structures that underlie and support the deployment of digital technologies), providing service and governance, and controlling ‘data about people, places and processes in the city’ (Sadowski 2020, 6) is a remarkable new investment strategy for venture capital, based on accumulation through rent extraction, whose effects for our cities (and democracies) we can only imagine at this point.

In all these phases, commercially driven urban governance has severe distributional consequences. First, most of the costs of digital technologies are fully or partially borne through public taxes which effectively subsidize the private sector. By prioritizing investments in digital technologies and infrastructures, local governments often redirect public spending away from already underfunded areas of public intervention that address poverty (e.g.

social housing, education, or health), or basic urban services such as waste management and sewage systems (Hollands 2008, 2015; Söderström, Paasche, and Klauser 2014). Moreover, as Morozov and Bria (2018) and others point out, the ‘smartness’ of cities is strongly tied to previously privatized urban infrastructures and services in ways that justify ongoing privatization

Cities find themselves caught in a vicious cycle: The more services they subcontract and the more infrastructure they privatize, the more assistance they require from the likes of companies like Google in running whatever remains of resources and assets under public control. (Morozov and Bria 2018, 18)

Second, some of the costs of the smart city are directly charged to the individuals or households, e.g. the costs for smart (electricity) meters. These financial burdens disproportionately affect poorer households who may struggle to keep up with increasing costs of living (Viitanen and Kingston 2014, 810; Rauth 2015). Third, state efforts to recruit technology corporations and start-ups drive gentrification and intensify land and housing dispossession. Such distributional injustices take shape not only within but also between cities and regions: ‘the real geography of an unevenly-developed world of richer and poorer cities, regions and countries will not be effaced by the digital revolution’ (Rabari and Storper 2014, 40). As indicated by this quote, many critical scholars argue that existing distributional injustices are unlikely to be resolved by digital technologies and will likely be deepened and amplified by them. As a result, economic divisions in smart cities have to be expected, unless transformative action is taken, such as public and common control over conditions of production and ownership of digital technologies (Söderström, Paasche, and Klauser 2014; Hollands 2008, 2015; Viitanen and Kingston 2014; Köhler 2016, 273).

Recognition

Although not as commonly encountered as issues of redistribution, recognition of social inequalities and identity politics also characterizes discussions of justice in critical smart city literature. Yet, as Rose recently observed, the social dimensions of current critical scholarship on smart cities tends to be undertheorized (Rose 2020). While promoters of smart cities often argue that the benefits of technological innovation will accrue to all in ways that overlook existing social hierarchies and structures of oppression (documented in McFarlane and Söderström 2017), status inequalities along the lines of gender, race, and other axes of social differentiation shape and are shaped by digital interventions. As Sarah Elwood described, smart city politics are ‘assembled around deeply unequal social and spatial orders whose contradictions are de-politicized through techno-cultural ideologies that make these arrangements appear necessary and acceptable’ (Elwood 2020, 9).

Empirical research demonstrates that state-supported and corporate-driven urban digitization initiatives are deepening racialized and gendered hierarchies in ways that enhance dispossession and disenfranchisement. With smart cities, urban space is reconfigured in ways that benefit technical elites who are disproportionately white, male, and cis-normative (Wiig 2016; Wiig and Wyly 2016). Racialized and gendered people tend to make up the precarious

labor force that (re)produce the smart city. These ‘digital care workers’ include unpaid domestic labor, low-paid caring and reproductive labor, and volunteer work (Burns and Andrucki 2021). This reproductive labor is typically ignored in research and public discourse, contributing to forms of injustice that Fraser would call nonrecognition. In turn, digital technologies and algorithms—from CCTV to seemingly innocuous locative apps—enhance the surveillance, monitoring, tracking, and control of racialized and gendered groups, enabling and reinforcing forms of domination, disrespect, and violence (Noble 2018; Safransky 2020). State-sanctioned injustice and violence against marginalized peoples takes many forms, including the ‘algorithmic violence’ of data-driven urban planning as a new type of municipal redlining (Safransky 2020) and new forms of algorithmic surveillance such as facial recognition software which target marginalized and particularly racialized individuals (Noble 2018).

Conversely, some argue that a predominantly dystopian framing of smart city initiatives in critical literature can inadvertently serve to ‘reinscribe racial, colonial, and heteronormative ideologies’ by situating marginalized groups as ‘other’ to digital imaginaries and practices (Elwood 2020, 3). Feminist scholarship on the spread of digital technologies and how this changes the urban highlights the nuances and contradictions in the relationship between digital technologies and socio-spatial inequalities (see Knaus, Margies, and Schilling 2021 and further contributions to the special feature). Regarding research on smart cities more specifically, Datta’s analysis of precarious young women working in the margins of India’s smart cities shows how women face new challenges as urban centers race towards progress and opportunity through investments in digital technologies (Datta 2020). Yet, Datta’s research also demonstrates how digital technologies provide the means for young women to make their experiences of gendered and racialized violence public in ways that can mobilize policy change.

Similarly, working from the standpoint of feminist, Black, and queer relational ontologies and epistemologies, scholars of digital geographies locate progressive and creative possibilities in digital mediations to re-assemble socio-spatial relations (Elwood 2020; Leszczynski 2016, 2020). Elwood, for instance, points to the generative possibility of glitch politics, defined as ‘digital mediations that create slippages in hegemonic systems of economic, racial, social, sexual, and cultural stratification’ (Elwood 2020, 5; see also Leszczynski 2020). Glitch politics locate possibilities in existing hegemonic social structures, for example, through digital art installments in which trans people of color deploy digital wearables and locative devices to choreograph public performances that make visible state-sanctioned violence against trans peoples, while also enacting the conditions for mutual support and safety. Such interventions serve as reminders that struggles for recognition take many forms, and that digital technologies can be used strategically by status-seeking groups to reconfigure public discourse and to serve emancipatory ends.

Representation

In recent years, the smart city has been recast by promoters as ‘citizen-focused’, with claims that digital technologies will improve participation by promoting greater involvement in collective decision-making, augmenting the scrutiny of public agencies, and empowering citizens. Some go so far to argue that

digital technologies play a fundamental role in manifesting liberal democratic values, such as 'individual freedom, a more genuinely participatory political system, a critical culture and social justice' (Rabari and Storper 2014; quoting Benkler 2006, 31). Kitchin observes, for example, that some 'smart city vendors such as IBM and Cisco' have in response to criticism even started to rework their discursive framing by altering 'the discursive emphasis of some of their initiatives from being top-down managerially focused to stressing inclusivity and citizen empowerment' (Kitchin 2015, 133; see also Cardullo and Kitchin 2017; Shelton and Lodato 2019; Willis 2019; Ribera-Fumaz 2019).

The concept of representation as a key dimension of justice provides a helpful framework for examining claims that smart cities facilitate and enhance participation. Misrepresentation occurs with regards to three underlying logics of the smart city: (1) the positioning of citizens as consumers and sensors, (2) the corporatization of urban governance, and (3) the role of digital technology.

(1) In response to appeals to the democratizing potential of digital technologies, critical analysis of smart cities has identified instances of injustice that we can with the help of Fraser call *ordinary-political misrepresentation*. Consider, for instance, that the design of current smart city experiments and control rooms are hardly ever the result of participatory governance and democratic decision-making (Arbeitsgruppe Smart City 2017, 27). Perhaps one of the most clearly identified ways in which smart city narratives impede equal participation is through the positioning of citizens as consumers and as sensors rather than shapers or owners of digital technologies (Cardullo and Kitchin 2017; Viitanen and Kingston 2014; Ribera-Fumaz 2019). Clearly, technologies enable individuals to gather data, but since they are not enabled to meaningfully act upon it, citizens are reduced to sensors (Goodchild 2007), to 'both a generator of data and a responsive node in a system of feedback' (Gabrys 2014, 38). Accordingly, the alleged citizen orientation of the Smart City can be unmasked as a camouflaging 'buy-more' strategies. The reduction of citizens to consumers not only promotes the logic of markets, but it diverts attention from the procedures and practices that enable and constrain democratic participation.

Problematically, the digital consumer frame also contains biases and exclusions that leaves parts of the city and its population unaccounted for, particularly those that lack the resources, opportunity, or even desire to embrace digitally mediated forms of participation (Viitanen and Kingston 2014). As a corollary, citizens are challenged to provide (often app-based) solutions to practical issues, but 'not to challenge or replace the fundamental political rationalities shaping an issue or plan' (Cardullo and Kitchin 2017, 18). This also reduces participation to 'computational responsiveness [...] coextensive with actions of monitoring and managing one's relations to environments, rather than advancing democratic engagement through dialogue and debate' (Gabrys 2014, 38). The normative 'smart' citizen of the conventional smart city is one with structural advantage, leaving 'little room for the technologically illiterate, the poor and, in general, those who are marginalised from the smart city discourse' (Vanolo 2014, 893). Yet, potentially everyone will be disadvantaged because 'smart' systems tend to be 'more opaque' and difficult to navigate than existing urban systems (Rabari

and Storper 2014, 39). New forms of social exclusion work across scales, not only positioning individuals differentially but also cities and regions. Those people and regions who fail to adopt smart technologies may be then seen to be 'lagging behind' (Vanolo 2014, 891–892) and therefore devalued and excluded, thereby entrenching existing digital divides.

- (2) A second instance of misrepresentation lies with the increasing power of corporations to own and control technology and data (Bauriedl and Strüver 2017; Hollands 2015). Not only are digitally-mediated interactions dominated by the economic, cultural, and political values and interests of profit-maximizing private-sector actors (Hollands 2015), the ways the exigencies to which smart cities are supposed to respond—such as sustainability and climate change—are also increasingly shaped by corporate interests (Blue 2016; Rosol, Béal, and Mössner 2017). It is therefore reasonable to conclude that the turn towards technologically-mediated forms of governance will continue to favour the interests of transnational corporate actors over other stakeholders (Viitanen and Kingston 2014, 813–814). Drawing on Fraser's terminology, we argue that this type of critique is concerned with *misframing* and the process of frame-setting. What drives cities to embrace the hi-tech fixes is mainly determined nationally and globally, not locally. Yet, most struggles for change are fought at the local level. This again highlights the importance of situating the smart city critique within an elaborated, multi-scalar justice framework.
- (3) A third area of misrepresentation results from the ways in which digital technologies and artificial intelligence are restructuring the material and discursive conditions of participation by reshaping governance and subjectivity (for more detail see Greenfield 2017; Gabrys 2014; Rose 2017; Braun 2014). Digital technologies are not simply tools that may or may not be used; these technologies also change social relations in fundamental ways. As discussed in the previous section, smart technologies facilitate the government's capacity to monitor, anticipate, and suppress public dissent and resistance (Arbeitsgruppe Smart City 2017, 35; Laimer 2014). The presence and the requirements of smart technologies lead to new forms of desired, appropriate and permitted behaviour, to new forms of control and also new ways of attributing responsibility, with giving rise to the prospects of a 'disciplined city' (Vanolo 2014, 884). As Vanolo observes: 'The smart city discourse has an effect on the way citizens are supposed to behave. On the one hand, citizens are very subtly asked to participate in the construction of smart cities, on the other, they are implicitly considered responsible for this objective. This means that the citizen is re-subjectified in the form of an active citizen required to achieve his goals' (Vanolo 2014, 893).

Visions and designs of smart technologies are thus also leading to new forms of subjectification tied to the Foucauldian notion of responsabilization through participation (Rosol 2015). Finally, employing digital technologies also requires reframing the urban and urban processes in a language or code that technology can act upon. This is based, as Söderström, Paasche, and Klauser (2014) observe, on a problematic systems thinking, which reduces decision-making to 'technocratic conception of urban management where data and software seem to suffice' (Söderström, Paasche, and Klauser

2014, 317). Such framing glosses over the political aspects of urban policy development in which priority setting and contests over meaning are central. More significantly, big data and algorithmic governance are taking on new forms of agency that potentially extend beyond human control, even diminishing human political agency in fundamental ways, thereby reframing the conditions under which participation can meaningfully take place (Rodrigues 2016; Smith 2020; Kitchin 2017).

From the smart to the just city in the digital age

An alternative smart city?

As a response to these injustices, a dominant theme in the critical literature is the need for 'bottom-up' citizen-driven initiatives to challenge 'top-down' smart city interventions, for example, through a focus on establishing the right for all to the smart city (Cardullo and Kitchin 2017; McFarlane and Söderström 2017). This links directly to movements for the right to the city, long-standing activist and academic struggles which respond to 'urgent political priority of constructing cities that respond to human social needs rather than to the capitalist imperative of profit-making and spatial enclosure' (Brenner, Marcuse, and Mayer 2012, 2). As a corollary, more recent critical accounts do not stop at pointing out the problems of the smart city, but also voice calls for engaging with the smart city discourse by 'crafting [...] "alternative smart city stories"' (Söderström, Paasche, and Klauser 2014, 307; see also McFarlane and Söderström 2017; and particularly the contributions in Cardullo, Di Felicianantonio, and Kitchin 2019). Alternative conceptions of the smart city are based on the premise that change needs to start with people and with actual existing cities and their current problems, not with technology (Hollands 2015, 63). For example, they advocate for a shift from technocratic to place- and knowledge-based smart cities that are informed by the struggles in urban places that 'disturb, resist or create' their versions of smart urbanism (Söderström 2016, 63). They draw our attention to ways of a socially just use of technology, for example, by 'digitizing slums' to enable inhabitants to identify the assets and circumstances that are relevant to their survival (McFarlane and Söderström 2017). They point out the 'myriads of initiatives where technology is used to empower community networks, to monitor equal access to urban infrastructures, or [to] scale up new forms of sustainable living' (Söderström, Paasche, and Klauser 2014, 318) and in general promote a use of technology to empower people through participatory and citizen-based smart initiatives (Hollands 2015, 2008). Those proposed alternative visions of smart urbanism are valuable as they create counter-narratives and imagine what a progressive urbanism could look like.

However, how do we create a strong alternative vision that is not limited to what Krivý calls an *auxiliary* critique, which only adds 'particulars to the object of critique while leaving its foundational contradictions unexamined' (Krivý 2018, 14)? This means going beyond a critique of the smart city, which could be retorted by smart city advocates with 'Of course, that's our agenda, too' or 'Of course, we are working on it' (Krivý 2018, 21–22). For this reason, Krivý doubts that the smart city can be challenged by a 'bottom-up liberation of technologies

in the name of people' or by challenging 'the SC's corporatisation with liberal humanist values of inclusion, empowerment, sustainability and digital privacy' (Krivý 2018, 21). Also, Söderström, Paasche, and Klauser (2014) wonder about how to foster those alternative stories that are place-based insofar as they respond to local needs but still go beyond just 'anecdotal small-scale actions' (Söderström, Paasche, and Klauser 2014, 318).

From affirmative to transformative strategies

Returning to Fraser, we contend that alternative visions of smart urbanism which seek to promote participation and access to technology are *affirmative* remedies rather than being *transformational*. According to Fraser, affirmative remedies aim to correct 'inequitable outcomes of social arrangements without disturbing the underlying framework that generates them' (Fraser 1995, 82). Affirmative remedies have still valuable outcomes, and many would argue that intelligent urban systems can be used for progressive purposes. Digitizing slums, for example, fill in 'blank spots on our city maps' where governments lack critical information about urban life (McFarlane and Söderström 2017, 318). However, mapping blank spots does not address the underlying structures that makes slums possible in the first place. Vanolo, also examining digitizing slums, even points out the danger as it could result in 'stigmatizing and militarizing 'dangerous' places more and more' (Vanolo 2016, 32).

Therefore, emancipatory efforts must go beyond affirmative strategies to encompass transformative approaches that seek structural change. As Fraser emphasized, *transformative* approaches are 'aimed at correcting inequitable outcomes precisely by restructuring the underlying generative framework' (Fraser 1995, 82), i.e. transforming the status-quo. In our case that would mean shifting the discussion away from the smart city, even an alternative one, and towards the *just city and a just urbanism in the digital age*. A just city encompasses a *distributive* dimension oriented towards overcoming class inequalities, a *recognition* dimension oriented towards dismantling status hierarchies, and a *representation* dimension oriented towards enabling transformative opportunities for reframing the 'stage on which struggles over distribution and recognition are played out' (Fraser 2013, 195).

Retaining and regaining technological sovereignty

We see a promising practical attempt on how to go beyond smart city discourse and explore the possibilities of a just city in the digital age in the evolving movement for technological sovereignty (Charnock, March, and Ribera-Fumaz 2019; Lynch 2020).² Based in and starting in Barcelona since about 2014 this idea is gaining more and more international attention, from activists, scholars, and municipal politicians alike. Technological sovereignty movements seek to parallel grassroots movements for food sovereignty—developing as demand, practice, and grassroots movement since the 1990s—which assert that the people who produce, distribute, and consume food should control the mechanisms and policies of food production and distribution (Desmarais 2007; Wittman, Desmarais, and Wiebe 2010).

The City of Barcelona's Digital City Plan (passed in 2016 by a new progressive city government) has technological sovereignty as its core mission.

It includes a political agenda to change the actual political economy of digital capitalism in the city to end the oligarchy of technology providers and ensure the public sector regains control of digital services again (Bria 2017; see also Morozov and Bria 2018; Charnock, March, and Ribera-Fumaz 2019; Ribera-Fumaz 2019). In turn, grass-roots technological sovereignty movements seek to gain control over digital technology and data by building ‘alternative modes of developing, producing, and consuming technologies that are transparent, democratic, and work towards the overall goal to meeting community needs and re-producing collective life’ (Lynch 2020, 670). These goals are realized through different means, such as providing community managed broadband internet infrastructure including autonomous servers; providing cooperative and alternative economy initiatives in the housing, mobility, or food sector (like food cooperatives) with free software and digital services; reusing and recycling digital devices and equipment; and creating spaces for public debate, education, and reflection. According to Lynch, this entails exploring what postcapitalist politics (Gibson-Graham, Cameron, and Healy 2013; Gibson-Graham 2006) of digital technologies could look like as well as rethinking cities itself. The idea of technological sovereignty also connects to discussions on the platform commons and platform cooperativism (Scholz and Schneider 2016), which equally stresses the importance of democratic control over and democratic ownership of digital technologies and platforms based on principles of solidarity, democratic governance, and care.

While it is too early to evaluate the implications of this movements, we offer some first reflections. Generally, the idea and movements towards technological sovereignty gives new hope and inspiration. However, no municipality or citizen group can match the computing and financial power of GAFA—Google, Apple, Facebook, Amazon. Even if cities try to emulate Barcelona in gaining technological sovereignty, municipalities and citizens are restricted by economic models determined and controlled elsewhere (Morozov and Bria 2018, 21). Second, we would caution against an over-optimistic stance concerning the possibilities of digital technologies (see also Ribera-Fumaz 2019). As Morozov and Bria (2018, 22–23) pointedly write: ‘What does the ‘right to the city’ mean in a fully privatized, digital city, where access to resources is mediated by the swiping of a ‘smart card’ tied to our identity? How can this right be effectively exercised when infrastructure is no longer in public hands and corporations determine our terms of access—including the terms on which protests against them are to unfold?’ They conclude that ‘building hi-tech socialism using neoliberal infrastructure may very well be impossible’ (Morozov and Bria 2018, 22). This means that any strategy to regain control over data again must also include ‘a strategy to reclaim infrastructure as a whole’ (Morozov and Bria 2018, 23). In other words: struggles for a just city in the digital age cannot only concern themselves with access and control over digital technology alone. A just city in the digital age must also include what we would call the basic ‘right to the analogue’, by which we mean enabling full participation in public life for those who, for various reasons, do not have access to or chose to opt out of digital technologies.

Moreover, the shifting terrain of governance enabled by digital technologies in which agency is increasingly allocated to non-human actors such as algorithms provides reason for pause about the emancipatory potential of digital ownership.

Not only are transnational corporations gaining powers that exceed the reach of state regulation, new forms of environmental and behavioural control through algorithms are emerging (see Gabrys 2014 for a similar critique). As Krivý (2018) remarks, the smart city has ‘disquieting ramifications for the future of urban planning, implying its obsolescence and replacement with cybernetic control’ (Krivý 2018, 21). As such, what may be necessary is finding ways to ‘preserve a space for politics and planning as capacities to collectively question, resist or withdraw at the same time’ (Krivý 2018, 24).

Conclusions

We are currently observing the increasing centrality of digital technologies in public discourse, proposed as responses to current social and political problems of the city. In this article, we presented a comprehensive definition and framework of justice to guide progressive efforts in assessing and reimagining smart city initiatives and argued for transformative remedies for injustice. Building on Fraser’s tripartite framework, we examined justice in critical smart city literature along economic, social, and political lines. We observed notable tensions, marked by a recognition on the one hand of the ways in which digital practices mediate and reinforce domination, dispossession, disenfranchisement, and social differentiation, and on the other, a desire to exploit the emancipatory potential of digital practices as sites of generative possibility for thinking, acting, and being otherwise. In assessing visions of alternative smart cities, we highlighted the need for transformational change, for instance, through technology sovereignty movements which provide collective ownership of data-intensive digital and algorithmic platforms and services.

Nonetheless, we also agree with Ribera-Fumaz (2019, 188), that ‘it is necessary to decenter the debate from the technologies themselves (...) and recognize that technological sovereignty is about acknowledging that technology-led solutions are not autonomous of broader relations of production.’ Yet, justice will not be realized through a sole focus on production and socio-economic struggles, as transformative approaches need to also address intersectional, diverse, and inclusive digital geographies.

Although we did not have the space to do so in this paper, attention to other background conditions, including nature and nonhuman (i.e. cybernetic) entities, is warranted in future research on justice in the smart city. Processes of digitization may also require a rethinking of the humanist framing assumptions on which Fraser’s concepts of justice and principles such as parity are based, for example by putting her insights into conversation with more-than-human conceptions of justice (e.g. Nussbaum 2009). In addition, further attention to the implications of normative conceptions of justice structured in accordance with Western histories of political thought is also warranted. Left unchallenged, Western normative conceptions of justice can tacitly reproduce the conditions which contribute to the dispossession and disempowerment of Indigenous and other marginalized peoples (Elliott 2016).

Overall, Fraser’s framework provides a comprehensive and nuanced engagement with the uneven ways in which rights, responsibilities, duties,

capacities, and opportunities are experienced across existing smart city contexts. As such, we encourage critical urban research to embed its smart city critique and its imaginaries for emancipatory change in a broad understanding of justice that recognizes the manifold ways in which inequities can emerge in the distribution of harms and benefits, as forms of misrecognition that deny voice and agency to certain social actors, and as misrepresentation when fair procedures and appropriate meanings are lacking or absent. Ideally, such critical engagement would continuously interrogate the normative frameworks and assumptions which inform how justice itself is imagined. Fraser's expansive approach to justice and her normative conception of participation parity offers a generative conceptual platform to critically interrogate what constitutes a just city in the digital age.

Notes

- 1 Its main characteristics being '(1) the new forces of production that reside in digital technologies of computing and communication; (2) the new divisions of labor that are appearing in the detailed organization of production and in related processes of social re-stratification; and, (3) the intensifying role of mental and affective human assets (alternatively, cognition, and culture) in the commodity production system at large' (Scott 2011, 846).
- 2 Note that this example is very specific and certainly not universally applicable, not even in other Western European cities and even less in Asian and Middle Eastern cities that are at the forefront of smart city developments. Thanks to one of the reviewers for this important reminder.

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