New scholarly pathways on green gentrification: What does the urban "green turn" mean and where is it going?

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Abstract

Scholars in urban political ecology, urban geography, and planning have suggested that urban greening interventions can create elite enclaves of environmental privilege and green gentrification, and exclude lower-income and minority residents from their benefits. Yet, much remains to be understood in regard to the magnitude, scope, and manifestations of green gentrification and the forms of contestation and resistance articulated against it. In this paper, we propose new questions, theoretical approaches, and research design approaches to examine the socio-spatial dynamics and ramifications of green gentrification and parse out why, how, where, and when green gentrification takes place.

Keywords

Introduction

In the past ten years, a number of studies have examined the ecological, social, political and economic dynamics and actors behind green gentrification – defined as new or intensified urban socio-spatial inequities produced by urban greening agendas and interventions, such as greenways, parks, community gardens, ecological corridors, or green infrastructure. Indeed, while many private investors, public officials, and planners couch greening projects in the language of sustainability planning (Gibbs and Krueger, 2007; Tretter, 2013), there has been an uneven response to existing inequities in the provision of parks or green space (Landry and Chakraborty, 2009; Heynen et al., 2006; Hastings, 2007; Park and Pellow, 2011; Dahmann et al., 2010) and little capacity to ensure the provision of benefits and access for all residents. These limits of urban greening initiatives are particularly pertinent if one considers that 55% of large US cities with urban sustainability plans referred to environmental justice (EJ) in 2010 but only 22.2% had clear action points on EJ (Pearsall and Pierce, 2010).

Scholars in urban political ecology, urban geography, and urban planning have demonstrated that many green interventions create enclaves of environmental privilege when low-income and minority residents are excluded from the neighborhoods where new green space is created. While some create such privileged enclaves unintentionally, others are accompanied by a clearly articulated strategy for attracting commercial and residential investments and bringing in more socially- and ethnically- privileged residents (Quastel, 2009; Dooling, 2009; Checker, 2011; Loughran, 2014). There are many cases

where developers leverage rezoning ordinances and tax incentives to redevelop vacant land, which they transform into high-end residences adjacent to green spaces (Bunce, 2009; Immergluck, 2009; Quastel, 2009; Dillon, 2014). During design and implementation, many greening projects remain blind to social vulnerabilities (Pearsall and Pierce, 2010) and new affordability issues (Pearsall, 2010; Checker, 2011).

In other words, while alliances between municipal planners, elected officials, and developers help greening cities enhance their competitive landscape, this urban "green turn" comes at a cost for minorities and low-income groups (Bryson, 2013; Heynen et al., 2006) – the cost is green, ecological, or environmental gentrification. Early on, Sarah Dooling defined ecological gentrification as "the implementation of an environmental planning agenda related to public green spaces that leads to the exclusion of the most economically vulnerable human population while espousing an environmental ethic" (Dooling, 2009), p. 630. This definition highlights that urban greening interventions are often formulated in a positive consensual, a-political, and green design-oriented fashion. In reality, though, the implementation of greening projects determines who sets the land use agenda by narrowing planning discussions to exclude combined goals of urban greening, equitable economic redevelopment, and environmental equity (Finn and McCormick, 2011). In the United States, projects such as the Boston Rose Kennedy Greenway, the New York High Line, the Philadelphia Rail Park, or the DC's 11th Street Bridge Park (Pearsall, 2018a; Loughran, 2014; Avni, 2018) are illustrative of such tensions and of the growth of development-led greening as a pivot for major investment and high-end real estate (Quastel, 2009).

In this paper, we start from the argument that the marriage of urban redevelopment with greening creates a paradox (Anguelovski et al., 2018b). Even while greening certainly provides economic, ecological and social benefits to many, it may create new and deeper vulnerabilities for some. This is especially so when what we can call "green gaps" become a new potential "green rent" for municipalities, private investors, and privileged residents. We propose the term "green gap," building on Smith's rent gap (Smith, 1987) and extending the concept of an environmental rent gap (Bryson, 2013) to describe how municipalities, investors, and privileged residents find new potential "green rents" from greening projects, couching them under discourses of win-win benefits and public goods for all. As a result, urban greening interventions targeting lower-income neighborhoods are increasingly perceived as a GreenLULU or green Locally Unwanted Land Use (Anguelovski, 2016a) by low-income residents and minorities. Faced with this new green space paradox (Faber and Kimelberg, 2014), they are organizing to contest the social effects of greening projects as a central part of efforts to create a just green city (Pearsall and Anguelovski, 2016; Connolly, 2018a).

Despite the increasingly theoretically sophisticated and empirically rich research on the displacement and exclusion embedded in urban sustainability planning, we call here for new research that would expand the theories, research designs, and empirical materials needed to understand the socio-spatial dynamics and ramifications of green gentrification. It is clear that greening does not always generate these processes, and it is important to disentangle where, when, and why green gentrification happens. The paper

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starts with an analysis and diagnostic of the local, temporal, and scalar inequities in urban greening – that is the creation and restoration of green amenities, spaces, and infrastructure – before examining theoretical and conceptual pathways to reinsert the political in planning for greener cities, and finally calling for a much needed analysis of the actual scope, characteristics, and scalar ramifications of green gentrification.

Local, temporal, and scalar inequities in urban greening and its diffusion

In this first section, we carefully establish and examine historic inequities in access to urban green amenities and green infrastructure; distill growing concerns over green gentrification in different contexts and community responses to them; and close with an analysis of the broader scales and rebound effects linked to environmental inequities in urban greening. We also identify broad research questions to be pursued.

-   **A triple bottom line of justice in "access" to green space and amenities**
Since the early 2000s, a rich collection of studies in urban geography and urban planning has examined the spatial distribution of green space in cities – moving beyond foundational urban EJ scholarship on the distributional inequities in exposure to or impacts of contaminated sites, industries, and other toxic land uses (Pellow and Brulle, 2005; Pellow, 2002; Bullard et al., 2007; Bullard, 2005). First and foremost, this research has found that green spaces in working-class and lower-income inner-city neighborhoods have historically been more often under-maintained, of lower quality, less numerous, and smaller in comparison with more affluent neighborhoods (Heynen et al., 2006; Dahmann

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et al., 2010; Pham et al., 2012; Wolch et al., 2005; Boone et al., 2009). In contrast, wealthier and white communities have historically enjoyed environmental privileges (Park and Pellow, 2011) through the greater presence of nearby parks, coasts, and other open spaces in their neighborhood (Landry and Chakraborty, 2009; Heynen et al., 2006; Hastings, 2007). In Los Angeles, for instance, in the early 2000s, areas with a 75% or more Latino population had access to 0.6 park acres per 1,000 residents, against 31.8 park acres for heavily majority white areas (Wolch et al., 2005).

Such inequalities in access to green space are explained by their historical and social context. Scholars in urban geography and sociology have, for instance, pointed toward the processes by which the political economy of urban development impacts housing tenure as a root cause for unequal access to green space (Perkins et al., 2004; Rigolon and Németh, 2018a). In the case of the US, urban neighborhood associations often played an active role in promoting new green infrastructure like tree planting. In Milwaukee, for example, these associations were influential in directing urban reforestation program funding towards owner-occupied (i.e., higher-income) neighborhoods (Perkins et al., 2004). These were the same associations that, in early twentieth century America, also often crafted restrictive covenants and supported segregation ordinances to reserve properties for white owners, which brought a disproportionate share of trees in cities like Baltimore to higher-income white neighborhoods (Boone et al., 2010). These dynamics were sometimes formally codified in city policy, as was the case with Austin (Texas), where early plans show the creation of separate black spaces in areas that were underserved with parks (Busch, 2017).

However, the historic association between social groups and greening is not always linear. Postwar segregation patterns, which mostly involved whites leaving city centers in the US, meant that Black residents who moved to formerly White neighborhoods inherited many green spaces. In cities like Baltimore, these spaces were often underfunded and included mostly smaller and more crowded parks (Boone et al., 2009). As well, the organizing on the part of communities of color that began in the 1980s resulted in the creation of many new green spaces in historically non-white neighborhoods. Given this complex, non-linear history, there is a need to connect empirical studies on green space distributional inequities with long-term exclusionary processes embedded both in the political economy of development and in the (re)creation of urban nature.

A second important aspect of this literature deals with justice as a form of recognition of identity, preferences and uses (Schlosberg, 2007). Critical urban geographers and cultural geographers have started to highlight the importance of better understanding the connections and relationships that different groups have built over time towards urban nature and green spaces. Many residents of color associate green space with a traumatic history of disinvestment, racial violence, lynching, and exclusion (Finney, 2014; Brownlow, 2006) and with environmental privileges afforded mostly to white residents (Park and Pellow, 2011). Furthermore, while larger parks might provide greater ecological benefits, they might also feel more insecure than smaller and closer pocket parks when those larger spaces are located in high crime areas (Kuo and Sullivan, 2001;

Anguelovski, 2014). Such analysis is essential for understanding other socio-cultural and neighborhood environmental factors that shape access to green space and green infrastructure. For example, in Los Angeles, Latino residents face ethno-racial and nativist barriers in their use of local parks derived from a predominance of white park users, a lack of minorities in adjacent neighborhoods, fears of aggression, and direct discrimination (Byrne, 2012). Therefore, critical research on urban greening should continue to expose clearly the role of socio-environmental and cultural history in creating oppressive experiences, anxiety and chronic stress, socio-spatial segregation, and overall poor access to protective green spaces for minority and low-income residents.

A third direction comes from the cultural studies approach, which points to a need to expand our understanding of how restored green amenities can exclude residents because of their inability – in the planning and design phases – to address issues related to their perception, interactions, and use of green spaces (Checker, 2011; Kabisch and Haase, 2014; Haase et al., 2017). Indeed, from a procedural justice standpoint (Schlosberg, 2007), when parks are being designed, if surrounding residents are not involved and incorporated into decisions, it is more likely that their needs, languages, identities, and uses will not be considered or reflected in the outcome (Kabisch and Haase, 2014; Byrne, 2012). In contrast, early co-production of space can help residents feel recognized and strengthen their attachment to place and their individual and group identity (Anguelovski, 2014; Scannell and Gifford, 2010), with greater opportunity for strong interpersonal relations (Kabisch and Haase, 2014; Connolly et al., 2013).

In sum, recent literature on the social roots of urban green space access shows a continued need for scholarly attention to how different green space characteristics influence residents' perceptions and behavior. In turn, there is a need to unpack how these elements relate to distributional justice, and how the process of planning, design, and creating urban green space and infrastructure might mitigate – or reinforce – distributional inequities.

- **Emerging concerns and contestation over green gentrification**

Urban green inequalities are not only historical. Since the late 2000s, new studies have examined the social and racial impact over time of new or restored environmental amenities such as parks, greenways, or playgrounds (Dooling, 2009; Hagerman, 2007; Quastel et al., 2012; Quastel, 2009; Tretter, 2013)(Hagerman, 2007), or the clean-up and redevelopment of hazardous or contaminated sites into green and more livable neighborhoods (Gould and Lewis, 2017; Pearsall and Pierce, 2010; Pearsall, 2013; Curran and Hamilton, 2012; Dillon, 2014). Much of this scholarship has focused on exposing the relationship between the creation or restoration of urban environmental amenities, subsequent demographic changes, and real estate price increases. In the US, neighborhoods benefiting from Superfund clean-up have seen mean household income increase by 26% and proportion of college-educated residents by 31% (Gamper-Rabindran et al., 2011).

The use of methods and models from urban real estate economics has also demonstrated that the creation of gardens and parks enhances the desirability of a neighborhood – even

before their construction – and eventually contributes to increases in property values (Conway et al., 2010; Sander and Polasky, 2009; Immergluck, 2009) and high-end housing constructions. In New York, for instance, the restoration of the Marcus Garvey Park (Harlem) led to the subsequent development of luxury condominiums priced well above the historic average (Checker, 2011) benefiting real estate developers and upper-class residents. In contrast, the widely agreed-upon conclusion (except in a few studies, see Eckerd, 2011) is that these neighborhoods become pricier for long-term residents eventually unable to benefit from environmental clean-up (Checker, 2011; Gould and Lewis, 2017).

In other words, green gentrification research contributes to exposing the relationship between environmental change and gentrification, and its implications for residential segregation and economic development dynamics. Yet, it leaves unaddressed more refined questions such as, what does "access" to green amenities mean to long-term residents? How does "access" materialize in practice and in the experiences of different residents?

In response to concerns over green gentrification, some long-time residents and community activists have started to contest urban greening interventions. Studies of this resistance bring together scholarship in urban geography and urban sociology. Some of the resistance builds on the strategies and tactics of traditional environmental justice movements (Pearsall and Anguelovski, 2016), but also demonstrates classic dynamics of collective action at the neighborhood level (Schuetze and Chelleri, 2015; Pearsall, 2013;

Tretter, 2013); the emerging politics of community organizing through an alliance between EJ groups and community development organizations (Scally, 2012), and the social movement impacts of direct action tactics (Anguelovski, 2015b; Rosol, 2013). In Seoul, for example, stakeholders involved in the planning of a Green Corridor to be part of the city's "Urban Renaissance Master Plan" articulated a vocal opposition against the proposal's top-down approach and lack of concern for traditional small-scale urbanization patterns (Schuetze and Chelleri, 2015). In addition, resistance to green gentrification includes leveraging environmental policies and regulations (Sandberg, 2014; Pearsall, 2013), participating actively in neighborhood planning exercises, and building alliances with progressive gentrifiers (Curran and Hamilton, 2012). Tactics also include advocating for complementary policy tools to ensure the right to housing (Thompson, 2015; Wolch et al., 2014; Ngom et al., 2016).

One of the most visible articulating frames of community resistance has been the "Just Green Enough" strategy (Curran and Hamilton, 2012; Wolch et al., 2014), through which residents, such as those in Greenpoint, Brooklyn, advocate for the clean-up of contaminated sites, the incorporation of its industrial fabric into redevelopment schemes (although some recent research points at the gentrification potential of re-industrialization strategies (Checker, In Press)). Other opportunities exist around housing trust funds and clear political commitment against land and real estate speculation (Wolch et al., 2014). In general, the long-term viability and desirability of what could be seen as "green compromises" remains unclear and contested (Faber and Kimelberg, 2014). Much attention needs to be placed on risks of cooptation, demotivation over time, and

competing goals and conflicts between social organizations and environmental groups.

A number of questions remain indeed about effective and long-lasting strategies for responding to green gentrification. Little is known about how activists address the negative feedback effect of green improvements, how they decide (or not) to build on the organizing frames and strategies of the EJ movement, and with which outcome. Activists are potentially caught in a position where they voice grievances that planners and developers might use to justify siting urban greening interventions in more privileged and white neighborhoods. Are some strategies and frames more successful than others in addressing community concerns over green gentrification and displacement? How do residents see themselves in the process of building alliances with "creative class" gentrifiers and how do their identities and priorities get rearticulated? What effect will such debates have on the sometimes competing politics of environmental and community preservation in cities? And, does gentrification have to occur for policy-makers to become aware of the tensions of land clean-up and green redevelopment?

As well, there are important questions about the role of traditional environmental movements in furthering green equity (Rigolon and Neméth, 2018b). While many articulate a no- (or neutral) growth agenda (Layzer, 2015), urban greening and green gentrification occur in the context of growth politics. Neither social equity nor environmental interventions are exempt from interactions with growth processes. Historically, environmental movements and EJ movements have not been allies, at least in the US (Pellow and Brulle, 2005). Given the inherent impact of greening on urban

growth, do mainstream environmental movements advocating for urban sustainability revise their growth positions to support greater environmental equity?

In return, questions are emerging about the role of municipal decision-makers and agencies in addressing or preventing inequities in greening: To what extent do municipalities attempt to address environmental and EJ claims and to what extent do they try to co-opt, manipulate, and rupture civil society demands? Here, there is room for theorizing the responses (or lack of responses) offered by planners and elected officials to respond to community concerns over risks of physical and social displacement, especially so when they are deployed in the name of ecological risk. International comparative analyses are in much demand. New analyses should assess, among others, which policy tools (i.e. rent control in Berlin, housing cooperatives in Germany, community land trust in the US, inclusionary zoning in Spain, or social housing construction in France) best address displacement and eviction within local contexts.

- **Multiple scales and rebound effects of environmental inequities in urban greening**

Much of the green gentrification scholarship is centered on neighborhood studies and examines the impact of new or restored green amenities on gentrification indicators at the local level (i.e., around each particular green amenity). Yet, residents displaced from green gentrification might be forced to move to contaminated, peripheral, and less livable areas (Gould and Lewis, 2017). As these residents are caught in a vortex wherein processes of destruction and renewal of urban nature continually churn people throughout

and outside the metropolis, new scholarship needs to better understand these processes and their outcomes.

More specifically, as some urban neighborhoods turn into ecological paradises and enclaves for a concentration of white, educated, and upper-income residents while pushing away vulnerable residents to non-greened neighborhoods, the result is a contemporary process of inverted suburbanization where heavy industry is largely removed from cities. White middle class residents once fled the contaminated urban environment for what were at the time literally greener pastures in the suburbs, leaving lower income populations of color to deal with the aftermath of industrial urbanization (Jackson, 1987; Fishman, 2008). Now, these greener pastures are sought and recomposed within the city itself. However, the territorial scale and ecological characteristics of some urban environmental improvements reveal a rather targeted and superficial "green treatment" rather than a more in-depth and wide-reaching environmental remediation in a neighborhood or district (Checker, 2011). Both dynamics – the link between greening and displacement of some to contaminated or less livable areas and the depth of ecological benefits— require a closer look.

Concerns about scale also require attention to policy diffusion of urban greening interventions. Understanding the unfolding of green gentrification beyond a few North American or European countries (Pearsall, 2018b), where much of the green gentrification research is situated, could lead to insightful findings on urban greening practices in the context of the global smart, sustainable, and resilient city planning

orthodoxy (Connolly, 2018a). As cities increasingly sell urban greening (and resilience) as an international brand, the equity implications of land use projects deployed for instance to address " climate resilience" issues – such as flooding in New Orleans or Jakarta or sea level rise in Boston or Manila – and other environmental risks are poorly understood (Anguelovski et al., 2016), and would benefit from a greater emphasis on social vulnerability and risk (Connolly, 2018b).

In this regard, new research should examine which interests are served by such an orthodoxy and how it has been adopted, diffused, and transformed both discursively and in practice in cities across development levels, political contexts, and histories of urbanization. Such research can build on a rich tradition of methods and theories in the field of comparative urbanism (McFarlane, 2010; Robinson, 2011; Lees, 2012). It also benefits from a growing interest in eco-geopolitics -- the study of how nature and the environment are being governmentalized through discourses of 'environmental protection' and environmental security as new tools for socio-spatial control (Lopes de Souza, 2016). This research line extends as well to the production of socio-nature and exclusion in the urban global South (Zimmer et al., 2017), especially places undergoing continued processes of rural-urban migration. As the construction of a green belt in Medellin reveals, thousands of rural migrants escaping the armed conflict are being affected by new large-scale green infrastructure which further illegalizes their land "occupation" and uses, while, at the same time, overlooking other illegal land practices by wealthier residents and real estate developers benefiting from "landscapes of pleasure and privilege" (Anguelovski, Irazábal, and Connolly, accepted).

Green gentrification scholars should also pay attention to which type of "greening-led" displacement and dispossession occurs in non-formal versus formal property systems, in relatively safe versus military-controlled or 'pacified' cities, and in nature-rich versus nature-poor cities. Further questions include: To what extent are green infrastructure interventions utilized as a tool to create new green enclaves for upper-income residents while creating new forms of (land) (in)securities, discipline and control for lower-income residents and racial minorities? How does municipality-led urban greening transform and undermine existing informal relationships to nature and socio-ecological landscapes among the residents of informal settlements? Such research would respond to calls to further theorize gentrification at a global scale, especially in the global South (Lees, 2012; Lees et al., 2015; Betancur, 2014; Smith, 2002; Janoschka et al., 2014).

A final point to consider here is that green gentrification involves internally contradictory processes that may generate rebound effects wherein the ecological benefits of greening are all but lost due to increased environmental impacts of new resident lifestyles. The beneficiaries of urban greening, those whose behavior is often portrayed as more sustainable and committed to green consumption, must be more carefully scrutinized. While their access to new environmental goods is a form of environmental privilege because of the ability of upper classes to capture the benefits of greening – and higher property prices in the vicinity of green projects – little is known about the lifestyle and footprint of those residents. Park and Pellow (2011) already exposed the contradictions of wealthy property owners in Aspen who advocate for the preservation of natural spaces

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while exhibiting lavish lifestyles contrary to environmental sustainability. Researchers could further build on this line of research (Sayer, 2014; Park and Pellow, 2011) to examine the rebound effects, or countervailing tendencies, that can be linked to living in newly greened areas and their associated high-end luxury homes.

Reinserting the political in planning for greener cities

In view of these questions, we are thus confronted with the need to articulate the path toward reasserting the political into urban greening as a strand of the sustainability agenda (Swyngedouw, 2007). In this section, we propose theoretical expansions and innovations in research design in order to repoliticize the planning and practice of urban greening.

- **Demystifying urban greening as a public good for all**

First, we suggest the need to bring the political back into the practice of urban greening to debunk the claim that urban greening is a public good for all. Rather greening will have a mix of social and ecological effects requiring a deeper analysis of the conditions and pathways through which greening can help to bring about "just sustainabilities" (Agyeman, 2013). Many cities unproblematically brand themselves as being the most livable green city to attract investment and creative class residents in the current trend of competitive urbanism (Anguelovski, 2016a). Cities often build their green self-branding strategies upon studies in real estate, urban ecology, and public health highlighting the multiple benefits of greening: Urban green spaces contribute to absorbing carbon

emissions (Baró et al., 2014); improving physical and mental health outcomes (Dadvand et al., 2015; Triguero-Mas et al., 2015; Gascon et al., 2016; Wolch et al., 2014); increasing social interactions from being in contact with nature (Connolly et al., 2013); and creating safe havens for marginalized residents recovering from environmental trauma (Anguelovski, 2014). Yet, urban geographers are increasingly critiquing a-political or post-political approaches to sustainability planning and their lack of attention to equity issues (Gibbs et al., 2013; Gibbs and Krueger, 2007; Swyngedouw, 2007),

In that sense, existing studies of green gentrification complicate the "green is always good" argument by drawing to various degrees on gentrification theory. One set of studies uses Smith's (1979) or Clark's (1988) "rent gap theory," which examines the increment between potential ground rent and actual ground rent. Smith focused on general processes of disinvestment and housing stock decline as a force for creating rent gaps, while green gentrification literature adds a greening explanation. While pollution and contamination may depress property values, it also creates what we can call a "green gap" (Anguelovski et al., 2018b) – through the perceived benefits and accrued values of cleanup and green intervention (Bryson, 2013). In Atlanta, for example, housing values within 400m of new green infrastructure spiked by 30% in comparison with similar properties 1.6km away (Immergluck, 2009). These studies showing the formation of a green gap in urban real estate markets align with production-side or market-led gentrification studies.

A smaller subset of green gentrification studies reflects supply-side or gentrifier-led theories of gentrification, thereby reversing the hypothesized temporal relationship

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between greening and gentrification. From this perspective gentrifiers are those leading the demand for a clean and green environment as part of their search for improved built environments (Baviskar, 2003; Mir and Sanchez, 2009). For instance, Baviskar (2003) noted that "bourgeois environmentalism" in India led to the displacement of slums in the name of environmental cleanup. The development of supply-side explanations such as these alongside demand-side explanations has also led to combined approaches, including the "gentrifier-enhanced" process described by Curran and Hamilton (2013) in their study of the remediation and redevelopment of brownfields in Greenpoint, Brooklyn. Yet, these new studies do not offer theoretical refinements of the new forms of exclusion, erasure, and displacement in green gentrification, and many do not go beyond providing measurements or case studies of the green gap theory.

There are also green gentrification studies that do not explicitly incorporate gentrification theories into their frameworks but instead use broader concepts from critical urban sustainability studies. For instance, several scholars have conceptualized green gentrification as a form of "urban sustainability fix" (Goodling et al., 2015; Long, 2016; Rosol, 2013; Tretter, 2013; While et al., 2004) to explain how capitalism makes sustainable development a profitable goal. Others (Abel and White, 2011; Dale and Newman, 2009) describe green gentrification as one of the tensions in Campbell's (1996) sustainability triangle, which illustrates development and property conflicts that emerge as cities aim to achieve the three dimensions of sustainability (ecology, economy, and equity) (Campbell, 1996). As well, Schuetze and Chelleri (2015) develop the term "sustainability fallacy" to support their critique of large-scale sustainability planning in

Seoul, South Korea (Schuetze and Chelleri, 2015). In sum, a variety of conceptualized lenses have been used to demystify the fact that green is good for everyone and under any circumstances as part of urban interventions.

- **Uncovering dispossession, green accumulation, and financialized urban development**

In the next phase of green gentrification research, there is a need to further develop the theoretical implications of distributional, interactional, and reparative justice by examining concurrent processes of dispossession and accumulation in urban greening and green development. We call for green gentrification scholarship to examine how urban greening contributes to invisibilizing the environmental and social practices of long-term residents, by rebranding neighborhoods and cities as green, smart, and resilient; by flattening their historical and ecological landscapes; and by erasing their sense of belonging and combined relationship to their neighborhood and to the local nature. Green gentrification research should not only be about examining physical displacement but also social, cultural, and mental displacement (Brand, 2015; Anguelovski, 2016b) and dispossession (Anguelovski, 2015a; Valli, 2015).

The possibility for dispossession should also be theorized not only in the context of new park, garden, or greenway creation (Safransky, 2014; Dillon, 2014), but also in the context of a wider understanding of urban green shifts during or after green climate adaptation interventions (Anguelovski et al., 2016). In Miami Dade County, Keenan shows how the responsive social economic behaviors to climate impacts operate to

destabilize geographies and real estate markets whose inferior or superior qualities for supporting human settlement are subject to climate gentrification (Keenan et al., 2018). Gentrification because of climate adaptation and resilience planning also manifests itself through the erasure of long-term green practices and socio-cultural losses of vernacular uses of green space and traditional relationships to nature within "marginal" or informal land under the utilitarian rationale of serving the greatest public good, as the case of the Medellin green belt illustrates (Anguelovski et al., 2016).

Scholarship on green gentrification would thus benefit from further examination of green accumulation through diverse environmental materialities and concurrent processes of erasure and silencing of voices, identities and practices. For instance, how do competitive visions of acceptable nature, landscape, and environmental practices get imposed, questioned, and renegotiated by a variety of public and private stakeholders (Goodling et al., 2015)?   While numerous studies in urban political ecology have demonstrated how different meanings of nature have influenced how planners conceive and develop parks, and for whom and which uses (Perkins et al., 2004; Boone et al., 2009; Brownlow, 2006), greater attention should be placed on those practices in the context of land redevelopment and new urban and peri-urban greening that attract local and foreign capital. Here, we need to closely look at how green space planning, design, and management intersect with the cultural politics of race, class, and nature, and in return create new socio-natural identities in and around cities for newcomers and investors. Other promising theoretical pathways have started connecting the literature on environmental gentrification (broadly defined) and the literature on settler colonialism

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that uncovers the many practices of land grabbing, frontier-driven value capture, landscape manipulation, and invisibilization of resident-driven land practices and uses (Safransky, 2014; Safransky, 2016) exhibited in many urban greening projects – those that Safransky calls "accumulation by green dispossession."

Related to this, concurrent processes of green accumulation and dispossession are, to an increasing extent, driven by new finance models for urban development that are specifically designed to generate enhanced economic value through greening (Bakker, 2007; Castree, 2008). As greening becomes a communication and selling tool for cities, it is indeed increasingly monetized, financialized, and can create speculation and rent capture. Thus, challenging the dominant imaginary that green is "good" for everyone and reinserting the political into urban green planning requires dissecting the role that finance capital and financialization play in urban greening, particularly as greening moves from being a risky endeavor to a highly profitable one. Green spaces and infrastructure seem indeed now to increase the marketability of neighborhoods (Gibbs and Krueger, 2007; Tretter, 2013) and elicit new hopes of economic growth, revitalization, and increased competitiveness through business investments (Dooling, 2009; Quastel, 2009). Yet, as greenways, parks, or redeveloped waterfronts often act as anchors for development-oriented greening, they tend to generate concentrated investment and high-end real estate development. Unpacking financial actors, their intermediaries, and economic beneficiaries – both in the global North and South – is an important next step for green gentrification research.

Furthermore, from a broader theoretical standpoint, there is an urgent need to disentangle the role that greening plays in the urban development process vis-à-vis the financialization of nature (Brand and Wissen, 2014; Sullivan, 2013) and the financialization of urban development (Weber, 2002; Rutland, 2010). This is a particularly important endeavor because new financial instruments and tools – from green bonds to property assessed clean energy programs – are being mobilized to fund urban greening, in many cases connecting future green urban development to future value and resource creation (Knuth, 2016). This exploration can help unpack how emerging strategies of urban "green grabbing" (Fairhead et al., 2012) operate within the broader context of green capitalism (Prudham, 2009; Wallis, 2010) characterized as a systemic attempt to "solve" economic and ecological crisis through integrating ecological conditions – in this case greenspaces – into the circuits of capital accumulation, towards new and supposedly sustainable growth trajectories.

- **Examining health and wellbeing outcomes in (green) gentrification**

Next, in relation to well-being and health, we advance that more greening does not necessarily translate into better health. This is another assumption that needs to be re-politicized. Research bringing together environmental epidemiology, ecology, sociology, geography, and urban planning needs to uncover the full range of pathways by which urban greening can impact urban health justice in the context of urban greening interventions (Cole et al., 2017c). The reliance of environmental epidemiology studies on the health effects of residential proximity to green spaces (controlling for SES, race, and ethnicity (Dadvand et al., 2014) and of the normalized difference vegetation index

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(NDVI) as an indicator of green space leads to a narrow and at times biased view of the connection between green space and health (Cole et al., 2017c). There needs to be space for studies considering how issues of interactional and procedural justice might undermine whose health benefits from urban greening (Anguelovski et al., 2018a). Many studies indeed overlook cases where residents do not welcome greening projects (for example, in cases of previous experiences of discrimination, violence, or insecurity) and how such historical and social contexts may impact how, or if, the health of residents benefit from green space. In addition, researchers are still grappling with how one determines what types of greening or what aspects of greening most impact health. Mixed methods studies bringing environmental epidemiology and environmental psychology combined with qualitative research in urban geography would also help bring together broader understandings of greening impacts on health with analysis of how the experiential and, even the corporeal, matter for residents to truly benefit from green space. There is much potential from research combining qualitative analyses of green space planning, design, and construction; biomedical research looking at changing hormone levels, skin cell and other bio-markers in understanding how people differentially experience greening; and public health cohort studies (via interviews or surveys) of residents in (green) gentrifying neighborhoods.

Last, in terms of the related effects of gentrification – and green gentrification in particular – on health, there is also a need to recognize – in public health in particular – that gentrification, and by extension green gentrification, might mediate the positive relationship between access to green space and health, and may exacerbate rather than

ameliorate inequities in health by race or socioeconomic status (Cole et al., 2017a). New studies and research designs in environmental epidemiology need to account for findings showing that gentrification is often associated with residential displacement (Smith, 2008) and with changes in the social environments of residents remaining in gentrifying neighborhoods (Anguelovski, 2015a) and thus may create new forms of health, social, and racial inequities. While recent studies have begun to demonstrate the latter through traditional epidemiologic methods, fewer have tackled the challenge of quantifying the health effects of gentrification-linked displacement. In fact, displaced residents are the very same individuals who are often considered "missing" in longitudinal studies due to logistic difficulties in tracking or to the conceptualization of displaced individuals as irrelevant to the study of how long-term exposure neighborhood characteristics affect health. The displacement of vulnerable residents may result in disrupted social ties and the perpetuation of geographically concentrated poverty, accompanied by increased exposure to chronic stress, ultimately leading to worse health outcomes among displaced residents (Fullilove and Wallace, 2011; Keene and Geronimus, 2011) and to the impossibility of making healthy cities really healthy for all (Cole et al., 2017b).

As a result of the possibility of green gentrification, there is a need for research designs capable of modifying modeled health benefits from greening in order to account for the expected effects on vulnerable populations. Traditionally-used cross-sectional studies should be replaced by case-control or longitudinal cohort studies to analyze the impacts of green gentrification on health (Anguelovski et al., 2018a). This is especially the case because gentrification may also create stresses such as raising prices and changes to

familiar neighborhood social environments, and eventually reduce positive health impacts, particularly for more vulnerable residents who are *not* (yet) displaced. Emerging evidence indicates a potential interaction between race (as a measure of social stratification) and gentrification, indicating that gentrification may have benefits for more privileged residents while harming vulnerable residents. Such interactions between gentrification and race have been found in studies of preterm birth (Huynh and Maroko, 2014) and of general self-rated health (Gibbons and Barton, 2016). In both cases, while gentrification itself had either no effect, or a positive impact on the outcome for residents at large, negative impacts of gentrification were found for black residents. Such results call for further public health research on the differentiated benefits that green space and green infrastructure have for urban residents and on how green accumulation, dispossession, and financial capture create new health and well-being impacts.

Understanding the magnitude and ramifications of green gentrification

In this last section, considering the historic inequities in access to urban green space and infrastructure, the more recent manifestations of inequities through processes of green gentrification, and the need to repoliticize the role and values of urban greening interventions for urban residents, we propose further analytical expansions and design innovations for future research. More specifically, we highlight that for researchers on green inequalities and gentrification to advance critical urban scholarship and be credible among a variety of audiences in their call for repoliticizing greening, they must be able to clearly parse out the scope and magnitude of green gentrification, the conditions and

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contexts under which it takes place, the characteristics of "greenness" that drives green

gentrification, and the broader enabling conditions and ramifications of green privilege.

- **Parsing the scope and extent of green gentrification in the city**

The commonalities of the large majority of green gentrification studies include their site-

specific focus (usually a single park or a certain neighborhood). To date however, limited

attention has been paid to measuring the scope of existing gentrification over an entire

city in the context of widespread environmental improvements (Pearsall, 2010; Abel and

White, 2011; Anguelovski et al., 2018c). An exception here is a recent study of 18 new

municipal parks and gardens in Barcelona, in which researchers find that in some

districts, the percentage of residents holding a bachelor's degree or higher increased by

nearly 28% on average around a new local park against only a 7.59% increase for the

district as a whole over a period of 10 years (Anguelovski et al., 2018c).

Following this type of large-scale study, we call here for researchers to offer a more

nuanced analysis of the occurrence (or absence) and extent of green gentrification across

an entire city. It is also necessary to explain why green gentrification occurs in some

circumstances and not in others. This approach might fruitfully look to GIS-based

research in environmental justice (Maantay et al., 2010) and geographically weighted

regression (GWR) techniques, especially those that identify where statistically significant

relationships between a given demographic change and distance to park exist, and where

it does not within a city (Anguelovski et al., 2018c). This approach might also look to

broader spatial regression techniques capable of quantifying the relative role of greening

as opposed to say reduced crime rates, transit improvements, or qualities of housing stock in explaining demographic changes (Papachristos et al., 2011; Eckerd, 2011). Some studies suggest that the presence (or not) of green gentrification is linked to the housing characteristics and types of architecture of a neighborhood (Immergluck, 2009; Anguelovski et al., 2018c); to associated development projects that rebrand a neighborhood into a technology square (Levine and Harmon, 1992); and to the proximity of a neighborhood to jobs, resources and public transit connections to the city center (Kahn, 2007).

Thus, there is a continued need to carefully parse out the following question: In which types of neighborhood undergoing which amount and forms of urban redevelopment does greening predict or contribute to gentrification – and in which cases not? How does greening play out in relationship to gentrification in hot real estate market of growing global cities (i.e., Seattle, Rio, Mumbai) versus shrinking cities (i.e., Milwaukee; Cleveland) and recovering cities (i.e. Philadelphia, Sheffield)? Put differently, when is urban greening not gentrifying, and under which conditions? Here, one can hypothesize that greening might accompany and increase the ability of growing cities to brand in the global competition for attracting new creative or educated residents while greening in shrinking cities might still be more focused on neighborhood stability and social cohesion. More research needs to account for urban greening trajectories undertaken by cities (Connolly et al., 2018) and for the fact that not all greening projects are the same in different cities and have the same social impacts.

An important insight from this research is that, while greening is generally associated with higher home prices, property values do not *all* increase when they are in proximity to open or green space. Rather, higher property increases tend to be found in denser, centrally-located, upper-income, family-oriented, and also higher-crime neighborhoods (Anderson and West, 2006). In Philadelphia, for example, properties located on vacant lots converted into green spaces in moderately distressed neighborhoods (and not those in high-income neighborhoods) also witness higher increase in value in comparison with properties close to untouched vacant lots (Heckert and Mennis, 2012). Furthermore, when parks are under-funded or under-maintained, their quality is impacted (Wolch et al., 2005) and likely, in turn, their "gentrification potential" attenuated.

Such a characterization would bring a nuanced understanding of the neighborhood – or citywide – physical, design, and social features that play a role in green gentrification. For instance, it would allow researchers to assess whether neighborhoods with a high amount of vacant land witness greater green gentrification pressures. And, if so, in which contexts? Also, to what extent do more dense cities and neighborhoods seem to predict gentrification as those cities become greener? If conducted in a comparative way, such studies would also reveal which cities (and neighborhoods) in the global North and South seem more (or less) protected from green gentrification effects. Green equity indices could also be created to compare neighborhoods and cities across a country and between countries, and assess their ability to remain or become more equitable as they become greener.

The key challenge raised for green gentrification research with regard to population flows is to disentangle questions of equality vs. equity in green space provision and shed light on the past and new social exclusion and control mechanisms at play in greening projects (Brownlow, 2006; Checker, 2011; Taylor, 1999). When cities decide to provide green amenities *throughout* the urban area, they might address inequality in access to green space, but not all green spaces are going to be as appealing, attractive, and accessible throughout the city due to historic trends and physical barriers (Byrne and Wolch, 2009). It is also possible that socially vulnerable residents are displaced by green gentrification to neighborhoods also benefiting from new green amenities, but with worse living conditions overall – including poor housing, lower connectivity to downtown, or less public infrastructure and facilities (Anguelovski et al., 2018c). Those results call for new research approaches capable of uncovering the urban resegregation and repolarization patterns that might be the outcomes of urban greening.

- **Identifying the qualities and characteristics of green space in green gentrification**

Further, there is a need for research designs that identify the qualities of green spaces that predict gentrification. Does green space also need to have a certain density, cumulative effect, or connectivity? How can we measure the social value attributed to green spaces? New research design and methodological tools should be developed to assess what size, type, design qualities, uses, composition, materials' quality, or characteristics of green space account for social and physical displacement and jeopardize social justice (Anguelovski et al., 2018a)?

If innovative research designs and tools for understanding the quality of greenspaces across a wide area can be developed and combined with findings about the governance processes associated with greening in a city, important questions within green gentrification research can be addressed. For example, what qualitative characteristics of green amenity creation seem more conducive to inclusive greening and to reparative, interactional, distributional, and participative justice? Are small scale and more informal green spaces, for instance, buffers against gentrification? Does more inclusive community involvement in the planning of green spaces seem to guarantee a wider use of the new amenity? Does green gentrification vary in scope depending on whether we are examining a community-led greening project vs. a municipal intervention vs. a privately-sponsored green space?

Our ability to answer those questions will also depend on the recognition that a historical analysis of green space perceptions in specific neighborhoods will be essential in order to shed light on the types, design, and composition of green amenities that might be more protective of the needs, preferences, and uses of vulnerable residents – bringing together different types of justice. In Berlin, for example, Muslim women ask for protected public green areas where they can feel secure and secluded from men's eyes. Latino residents prefer green spaces where they can engage in socio-cultural recreational activities (Kabisch and Haase, 2014). In that sense, researchers need to better uncover how residents perceive the processes and outcomes of greening; what makes green spaces and infrastructure inclusive and allow residents to develop a sense of comfort, security, and ownership; and the extent to which gentrifiers impose new norms, attitudes, and rules that

end up excluding long-term residents from green spaces.

- **Assessing the geographical reach and boundaries of green gentrification and privilege**

Last, with regard to questions of geographical reach and boundaries, fine-grained analyses of green gentrification impacts need to examine the full impact of one or a few green spaces on a city overall. For example, extensive preservation efforts targeted toward the wealthier and whiter west side of Austin, Texas in the 1990s generated deep gentrification pressures in the lower income mostly Black and Latino neighborhoods of the east side in the 2000s (Busch, 2017). As well, green infrastructure has effects that operate across temporal scales. Often, social outcomes related to greening result from tree plantings or preservation efforts that began decades earlier (Pickett et al., 2008).

Moving beyond inner-city boundaries and looking at the international connections of green gentrification, researchers would also benefit from integrating and enriching recent theoretical developments related to planetary urbanization and world-wide urbanization patterns (Brenner and Schmid, 2014; Brenner and Schmid, 2015; Arboleda, 2016). Planetary ("green") urbanization can provide a multi-scalar research frame to assess flows of financial resources and global investors into urban greening across space and place, towards understanding urbanization as a process that occurs within and beyond the urban. This can help uncover, for example, green gentrification not only as a process that creates and reinforces environmental privilege for elites within the city (Gould and Lewis, 2017) but also for urban elites across the world.

A planetary urbanization lens could indeed aid in tracing the local-global investment and decision-making flows that one or a group of green infrastructure projects may spawn, or in shedding light on how the creation of certain urban environmental amenities is intimately connected to shifting unwanted land uses and production elsewhere, often further away. The contemporary urban "green" condition and green growth should indeed be further explained by the ability of cities to draw on the resources and land of peri-urban and rural hinterlands to satisfy the industrial, manufacturing, and recreational demands of urban residents, thus generating more capacity for green urbanism and green space in the city center. For instance, cities import ecological resources to "feed" urban parks from remote (or less remote) territories in order to offer greem amenities and services to urban consumers. This process, at times, involves grabbing the land and resources of rural residents, sometimes in the Global South. In that sense, a metabolic analysis of resource flows towards the city would help uncover the interconnections of cities with their hinterland. Green gentrification scholars should thus continue to further push the limits of metabolic studies in urban political ecology to unpack how green gentrification has been enabled by and in turn produced what Heynen calls "new socio-spatial formations, intertwinings of materials, and collaborative enmeshing of social nature" (Heynen, 2014: 2).

Theoretical developments around planetary green urbanization would also benefit from bringing in Schnaiberg's et al. argument on the treadmill of production (Schnaiberg et al., 2002) applied to the urban green growth machine and to investors and the residents who

benefit from new green luxury living. The production of urban greening might indeed create a path for investors around the world to squeeze more surplus out of urban economies, their workers and their green environment through what we call a "treadmill of green production." This treadmill operates thanks to a new coalition of public institutions, elected officials, and private investors pushing for financially and environmentally unsustainable economies and behaviors. Either way, such a multi-sited and multi-actor approach can be useful in terms of conceptually linking and unfolding interconnected urban environmental processes and injustices and tracing the pathways and flows of global investments for urban greening.

Conclusion

This paper has contributed to the growing critical literature about urban greening and green gentrification in urban political ecology, urban geography, and planning. Here, we posit that the alliance between urban redevelopment and greening creates a green space paradox because of the ability of municipalities, private investors, and privileged residents to bank on an existing "green gap" and later capture a "green rent" from the social, environmental, and health benefits of newly created green neighborhoods. In this context, cities are in many cases actively creating a new green utopia for the creative class and a green mirage for lower-income and minority residents, who may end up excluded from the neighborhoods where green spaces are created or restored. In this process, some residents face the double circumstance of (a) having historically been excluded from large and quality green spaces (Heynen et al., 2006a) and (b) seeing their neighborhoods becoming grabbed, "greened" and rebranded as livable, sustainable, low-

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carbon, resilient, and/or green at their (future) expense in the context of a new green planning orthodoxy (Davidson and Iveson, 2015). More broadly, the green space paradox makes clean-up of industrial centers a zero sum game where with every gain for some comes potential losses for others.

In order to better understand processes and outcomes of green gentrification and inequalities, we first call here for a critical look at the multiple yet clashing values and significance of urban greening, especially so because of traumatic experiences of exclusion, oppression, and violence in green space for historically marginalized residents that undermine the assumption in many academic fields and within urban greening planning practice that greening is always viewed positively by residents and is good for everyone. In that sense, a critical examination of urban histories of land use planning, segregation, and urban development and of recent global financial interests in urban greening projects need to be undertaken in order to understand their conjoint role in creating exclusive experiences of green space access. Additionally, when green projects draw on rational top-down planning, they might exacerbate interactional injustice, avoid considering reparational justice, and silence or erase existing residents' connection to nature, green spaces, and green infrastructure – processes of invisibilization which must all been concurrently uncovered.

Second, we also argued for a precise assessment of the scope, magnitude, and role of green gentrification across an entire city and between cities in order for green gentrification research to be increasingly influential and persuasive. New spatial and statistical analysis should be conducted to differentiate gentrification from green

gentrification trends and to understand the main drivers of gentrification. Studies must also consider the role of green space design, size, type, quality, location, and density to assess the conditions and instances in which greening does predict and contribute to gentrification – and those instances in which it does not. From a public health standpoint, gentrification might also mediate the positive contribution of living in close proximity to green space and improved health outcomes.

Last, we highlighted the need for further research on the flows, scales, and rebound effects related to urban greening and green gentrification. For instance, the implementation of urban greening interventions in one part of the city might create real estate market pressures not only in its vicinity but also on the other side of the city. We also must examine the trajectories of residents pushed away by urban greening and the demographic transformations of the un-greened neighborhoods where those residents might be obliged to move as the only place they can afford. Questions of flows also force us to consider how the new green, smart, and resilient planning orthodoxy has moved South and been incorporated while re-created in the practices of cities in the Global South. In addition, we must examine how dynamics of planetary urbanization further enable the production of a green city through the exploitation and transformation of peripheral hinterlands and thanks to a treadmill of green production.

Research on green inequalities and gentrification has created a promising foundation from which to explore the essential limitations of the existing urban policy models that

seek to integrate social and ecological goals for urban development. This area of research

must expand, though, from a narrow focus on individual cases where it is fairly clear that

greening led to gentrification into a wider and more nuanced realm capable of

incorporating a broad spectrum of theoretical and methodological concerns. We call for

this expansion because, if done successfully, it may provide a frame for future urban

policy that transcends the limitations of urban sustainability and resilience and creates

more just and greener cities. It might also move urban greening away from being a tool

for urban redevelopment to becoming a powerful ambition and mobilizing force for

equitable, healthy, transformative urban arenas and addressing long-standing racial,

ethnic, and class inequalities in cities around the world.

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