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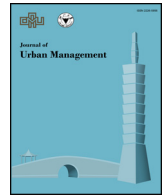


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White fragility as an obstacle to anti-racist resilience planning: Opportunities for equity-conscious partnerships

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1. Introduction

Despite more than forty years of progress in the development of ecological resilience research since C.S. Holling's publication of "Resilience and Stability of Ecological Systems" in 1973, the vulnerability of low-income communities and communities of color has only escalated. Although global climate change in the Anthropocene increases collective vulnerability for the human family, low income communities and communities of color, both within cities, and throughout the world are more vulnerable (Anguelovski et al., 2016; Baker, 2012; Bullard and Wright, 2012; Kashem, Wilson, & Zandt, 2016). In the United States, people of color and low-income communities are disproportionately likely to live in environments with poor air and water quality, limited access to healthy food and soil, in close proximity to toxic waste, in substandard shelter, and in locations more vulnerable to climate change and extreme weather events (Agyeman, 2005; Bullard, Mohai, Saha, & Wright, 2007; Bullard, 2007; Hood, 2005; Wilson, 2018). Even though resilience research calls for diverse and inclusive frameworks for adaptive co-management of social-ecological systems (Olsson, Folke, & Berkes, 2004), in many vulnerable neighborhoods, structural racism and classism prevent residents from having a seat at the table when decisions are made about their community (Agyeman, 2010; Bullard et al., 2007; Cole & Foster, 2001). Sexism, heterosexism, ableism, and ageism also limit equitable participation by (and protection of) diverse community members vulnerable to climate change and environmental injustices (Adamson, Evans, & Stein, 2002).

In light of these challenges, how can practice research frameworks for building resilience support the long-term well-being and adaptive capacity of vulnerable communities?

In this paper, I explore this central question and consider some of the limitations of ecological resilience research frameworks when applied to complex social-ecological systems, especially contested urban landscapes. Discussion of these limitations include consideration of concepts that are easily lost in translation, such as diversity, ecotones/edge-effect, self-organization, and hierarchy. The discussion of limitations also names the problem of employing "resilience" as a normative framework without 1) asking critical value-rational questions such as "resilience of what, for whom, and by whom?," 2) locating themselves in the systems they study, and 3) learning from (and with) marginalized communities of color who have been resilient against unjust systems before "resilience" became a field of study. Researchers are called to question whether they seek to understand and support the resilience of economic systems or ecological systems, the resilience of systems of oppression or liberation, and the resilience of their own privilege or of vulnerable communities.

These limitations and challenges are then illustrated and contextualized through the case of the Atlanta Beltline, a project renowned as an exemplar of resilient design. Initiated in a region known both for its history of civil rights leadership and for policies of racial segregation and "negro removal" (Holliman, 2010), this project reveals the challenges and opportunities for resilient design and planning to benefit vulnerable communities.

Drawing from observations from the Atlanta Beltline case and other literature on equitable resilient design, the article presents recommendations for researchers from privileged backgrounds seeking to enhance resilience in vulnerable communities. This article asserts that privileged researchers must first take responsibility for overcoming defensive tendencies such as white fragility

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(DiAngelo, 2011) that frequently arise in contested landscapes. When they fail to do this personal resilience work, researchers strain community leaders in vulnerable communities with the burden of providing this emotionally exhausting education and training, usually without compensation. To overcome these limitations, researchers are called to embrace their own vulnerability in service of more powerful relationships with community partners.

Working in authentic partnership with community leaders makes it possible for ecological resilience researchers to integrate their ecological expertise with local social knowledge to better understand and engage with complex social-ecological systems. Drawing on resilience theories like *panarchy*, transdisciplinary action research teams can develop small scale interventions that are more likely to catalyze systemic effects. This is especially true when they are conducted with awareness of larger systems, and in collaboration with other coalitions working to resist systems of oppression, as well as to create new structures supporting a just transition to a regenerative economy.

2. Limitations of mainstream resilience frameworks

Although socio-ecological resilience research frameworks have great potential to support low-income communities and people of color, these frameworks and their principles often have significant limits when applied to contested landscapes where vulnerable communities live. Many of these limits are a result of blindspots with regard to power, justice, equity, and history in social systems.

2.1. Diversity and its limits: From ecotones to contested landscapes

Mainstream ecological resilience theory emphasizes that the resilience of a system depends on its diversity, as well as frameworks and structures to support place-based learning and adaption among humans diverse knowledge and experience (Christian Rammel, 2007; Folke, Hahn, Olsson, & Norberg, 2005; Olsson et al., 2004; Plummer et al., 2012). Diverse places, then, are generally predicted to be more resilient. For instance, ecotones, the transitional areas between adjacent biomes or ecosystems, are known for their “edge effect:” the tendency for increased variety and diversity that enables resilience in the face of disruption (Blanchfield, 2011). Similarly, social scientists have found that diversity strongly contributes to innovation and adaptation in successful urban centers (Ashraf & Galor, 2011; Florida, 2014; Glaeser, 1996).

There are, however, important limitations to diversity as a descriptive and/or normative theory for resilience in social systems, especially with regard to concerns for social justice. The word ecotone connotes the tension amongst diverse species striving for survival in an uncertain territory: “ecotone” derives from the Greek roots *oikos* (home) and *tonos* (tension). Tension arising from diversity can indeed be a powerful, creative force that supports adaptation. This can be seen at an ecosystem level when diverse species find their place within ecosystem niches and a supportive web of complementary relationships. In these cases, although individual organisms or species may not secure long-term longevity, the larger system may be resilient (Downing, van Nes, Mooij, & Scheffer, 2012).

Unfortunately, in transitional urban spaces where patterns of uneven power and privilege have shaped the landscape, social diversity may just as likely predict social fragmentation as it would predict community resilience. In these inequitable social systems, advantages are systemically conferred on the basis of socially constructed differences such as race, class, and ethnicity – *not* biological factors of fitness to a landscape as would happen in an ecotone. Although scientists in the 19th century developed theories of racial difference based on genetics and argued for eugenics as a solution to urban poverty, the scientific consensus today has disproven the theory that there is a biological basis to race (McChesney, 2015). In the United States today, few places are left unscathed by inequitable structures of power and opportunity constructed on the basis of racial difference (Lipsitz, 2007).

2.2. Self-organization and its limits: From natural hierarchy to structural oppression

The inequitable power structures in social landscapes also make translation of ecological resilience’s theories of self-organization and hierarchy problematic when applied to vulnerable communities.

In ecological systems, resilience is related to the capacity of the system for self-organization, or “the power to add, change, or evolve system structure”(Meadows, 1997). Through the process of self-organization, as systems create new structures and increasing complexity, they also create essential hierarchal systems – nested systems of interdependent yet autonomous parts. As Meadows notes, “[i]f subsystems can largely take care of themselves, regulate themselves, maintain themselves, and yet serve the needs of the larger system, while the larger system coordinates and enhances the functioning of the subsystems, a stable, resilient, and efficient structure results” (Meadows, 2008, p. 82). This power of living systems – whether a human body with all of its organs, cells, and regulatory systems, or the planet as a whole, with all of its contributing ecosystems – has enabled the ongoing evolution of life on earth (Capra, 2005; Meadows, 2008). In thriving living systems, the parts contribute to the whole, the whole looks after the parts. This is also the basis of strong social contracts in strong democracies.

Unfortunately, as Meadows (2008, p. 160) notes, in social systems, “one aspect of almost every culture is the belief in the utter superiority of that culture” . Out of this belief, social systems often self-organize in ways that create hierarchical structures that subjugate non-dominant cultural groups. In these oppressive structures, the parts may contribute to the whole, but those with decision-making power over the whole allow some parts to flourish at the expense of others. Today, entrenched power structures strongly influence who holds the power to add, change, and evolve system structure – both in terms of who has a seat at the table, and who has decision-making power.

In the long-term, such rigidity threatens the resilience of the earth’s ecosystems (Goerner et al., 2018; Meadows, 2008). Over the

past 500 years, economic systems have evolved with entrenched power structures that have conferred material wealth and political control to a minority of the world's population, while producing conditions of vulnerability for others.

2.3. Resilience of what, for whom, and by whom?

Ultimately, the challenge of translating ecological conceptions of resilience to the resilience of vulnerable social communities comes down to fundamental questions about power and equity: **resilience of what, for whom, by whom, and through what structures of power?** These value-rational, power-aware, equity-conscious, contextual questions would have been deemed inappropriate for scientific research conducted in previously dominant positive epistemologies. They are, however, essential to making social-ecological resilience research matter for vulnerable communities (Flyvbjerg, 2001). As Vale (2014) has argued, “resilience can only remain useful as a concept and as progressive practice if it is explicitly associated with the need to improve the life prospects of disadvantaged groups”, yet this dimension is often lost in definitions of resilience drawn from engineering and ecology.

The question, “resilience of what?” is particularly important because of the agnostic nature of the term “resilience.” In the literature of ecology and engineering, and in common parlance, resilience is typically presented as a value-neutral property of a system – namely, the ability of a system to rebound in the face of disturbance to its basic form and function. A system that can bounce back may or may not be a socially just one.

For instance, from the perspective that resilience is the ability of a system to bounce back, capitalism and racism have proven to be remarkably resilient, co-evolving systems for more than 400 years.² Despite shocks to the capitalist banking system in 2007, it bounced back quickly with an unprecedented bank bailout in 2008. Capitalism's resilience has been supported by cultural myths that privileged groups in power are entitled to build their personal wealth through extractive and exclusive practices that cause social and ecological harm for the majority of “others”, low income communities and communities of color (Jordan, 1974). Operating from such assumptions, elected leaders created policies such as Jim Crow laws and redlining policies that prevented generations of African Americans from accessing economic opportunities enjoyed by their white counterparts. Long after de jure racial segregation ended in the United States, de facto segregation and structures of racism persist, often through our cultural scripts and our subconscious minds (Molina, 2014; powell, 2015).

When employing the concept of resilience to social-ecological realms, it therefore becomes critical that researchers and practitioners ask “resilience for what?” If we are unwilling to support these unjust systems, we need to develop frameworks that help us **notice, name, understand, and disrupt these resilient systems** that diminish the health and well-being of many. If equity and justice are not explicitly included in normative goals of those with power and privilege, they are easily forgotten (Oden, 2010). As Donella Meadows has noted, the most powerful places to intervene in a system are at the level of paradigm.³ The form and function of systems emerge out of the basic underlying assumptions, worldviews, and values.

Similarly, in asking, “resilience of what?,” practice researchers committed to advancing the resilience of *eco-systems* will also have to discern whether they seek to advance the resilience of *ecological* systems, or *economic* systems. This is, however, a false choice. After all, the word “economy” derives from the Greek roots *oikos* (home) and *nomos* (management). An economic system, then, is a system set up to manage one's home. Our homes are coupled social-ecological systems. *Economic systems, then, are systems for ecosystem management.*

If we seek to build social-ecological resilience in vulnerable communities, we need first to acknowledge that the dominant approaches to ecosystem management have typically *produced* the conditions of vulnerability with which they are contending. Indeed, geographers analyzing community responses to disasters conceptualize vulnerability as a dynamic condition, produced through historic interactions among economic, cultural and social processes (Dooling & Simon, 2012). If practitioners of ecological resilience intervene in a vulnerable urban community without awareness of the way the larger political economy has produced conditions of vulnerability, they may be more likely to catalyze processes of environmental gentrification (Banzhaf & McCormick, 2006) than to enhance the resilience of the residents who live there.

Ultimately, the process of answering the value-rational questions, “resilience of what, for whom, and by whom” requires researchers and practitioners to locate themselves in the systems they study. If they are to conduct ethical research that effectively builds resilience in vulnerable communities, they must also turn the lens back on themselves, practicing a critical self-reflexivity that will help them to understand their own agency, influence, and responsibility in the systems they have inherited, seek to understand, and hopefully seek to change. Although ecological resilience theory recognizes socio-ecological systems as interdependent, it less frequently recognizes individuals as complex systems that are both autonomous and interdependent with larger, social and ecological systems. Still under the influence of positivist paradigms, ecological practice tends to frame the researcher as an outside observer striving for objectivity and/or neutrality, outside of political structures (Reason & Canney, 2015). In reality, researchers of social systems are actors *in* those systems. Instead of striving to avoid the challenge of the “double hermeneutic,” researchers committed to enhancing the resilience of vulnerable communities must also consider their own position and their potential both to cause harm, and to meaningfully engage in ways that build capacity and well-being of vulnerable communities in contested landscapes. The contours of such landscapes have typically been shaped over years by power differentials resulting from systemic racism and classism.

² Although Adam Smith argued that slavery was inefficient for capitalism in *Wealth of Nations* (1776), narratives still emerged to justify unequal social status based on socially constructed racial differences.

³ Meadows originally asserted that the most powerful way to intervene was to shift the underlying paradigm/worldview of the system. She later concluded it was even more powerful to be able to transcend paradigms, remaining flexible and non-attached to mental models (Meadows, 1997).

Naming these structures, finding one's place in them, and working to disrupt them is deeply challenging, uncomfortable work. This work also requires dialogue and partnership with marginalized communities who have demonstrated their own resilience in the face of inequitable, dehumanizing systems. As such, researchers must cultivate resilience within themselves and learn from the resilience of community partners if they are to co-create a just transition to a regenerative economy that supports social and ecological well-being. This is especially important for white researchers working with vulnerable communities of color, as it will build their capacity to overcome the common phenomenon of “white fragility,” defined as “a state in which even a minimum amount of racial stress becomes intolerable, triggering a range of defensive moves” (DiAngelo, 2011). These defensive moves – including outward display of emotions such as anger, fear, and guilt, and behaviors such as argumentation, silence, and leaving the stress-inducing situation – function to “reinstate white racial equilibrium” (DiAngelo, 2011).

In other words, a lack of emotional resilience on the part of a white researcher is likely to contribute to the structural resilience of racism, by 1) exhausting (and then abandoning) community partners working for liberation, 2) failing to challenge structural racism for fear of confronting white fragility in white communities, and 3) implicitly accepting the status quo and denying root causes. Since power differentials related to racism and classism have generated conditions of vulnerability, researchers will need to cultivate their own capacity to actively dismantle those systems of oppression if they want to contribute to social and ecological resilience.

3. Colorblind-ed: The case of the Atlanta Beltline

Existing frameworks for socio-ecological resilience research have not equipped practice researchers to foster ecological resilience while addressing the challenges of equity, justice, power, and entrenched structures of economic oppression. One of the most celebrated resilient design projects in the United States, the Atlanta Beltline, exemplifies these challenges, the value of asking “resilience of what, and for whom?,” and the importance of locating one's own responsibility and agency in systems of interest.

The designers of the Atlanta Beltline are known for their success in reclaiming an underutilized network of rail infrastructure that intersects a ring of urban neighborhoods affected, over the years, by disinvestment. Through grassroots engagement across the metropolitan area, investors and volunteers have been transforming this space into a 22-mile greenway and multi-modal transportation corridor where residents can hike and bike their way all around the city, accessing park spaces as well as local businesses. Citizen foresters have been working diligently on transforming the greenway into a “22-mile arboretum”—“an elaborately curated, city-scale mix of existing and cultivated tree species that is at once an urban forest, an ecological connector, a corridor for scientific research, and a collection of remarkable public spaces” (Atlanta BeltLine Arboretum, n.d.). The project's founder, Ryan Gravel, published a well-acclaimed book, *Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities*, which shares the project's early successes and offers a blueprint for revitalizing cities through resilient design.

So far, the project has succeeded in creating beautiful places through ecological restoration and infrastructure improvement that have attracted new investment – Beltline authorities boast a roughly 3:1 return on investment, with more than \$1 billion in private redevelopment spurred by roughly \$350 million of public investment (Roy, 2015). Unfortunately, the city's economic growth-focused efforts have escalated gentrification pressure in the Historic Fourth Ward (H4W), a majority black, inner-city neighborhood that was one of the first to receive Beltline investments (Roy, 2015).

In neglecting to center equity and racial justice as priorities throughout the design and implementation process, the developers of the Beltline project failed to 1) name and disrupt the city's complex history of structural racism that contributed to urban disinvestment, white flight, and a racially segregated metropolis in the first place, and 2) draw upon the diversity of these areas as a source of innovation and systems transformation. Although project leaders intend that the “cumulative experience” of the Beltline will provide “a plant-based cultural narrative of the city's rich and diverse history” (Atlanta BeltLine Arboretum, n.d.), their presentation of history is selective, and their commitment to diversity and inclusion is limited, catering to the comfort of white audiences. Although so-called “gentrifying” neighborhoods like H4W have significant socio-economic diversity, grassroots participation in the project came primarily from newly arrived, young, white parents concerned about having a nice, safe neighborhood where their children could play. Critics note that “by ensuring the exclusion of the disadvantaged groups, who might raise fundamental questions regarding the current socio-political order, the BeltLine process seems to stall any possibility of truly political engagement or contestation” (Roy, 2015, p. 65). On the surface, the project's grassroots origins in socio-economically diverse urban environments would seem to reflect the potential for self-organization and innovation that is so important for system transformation (Meadows, 2008). Yet, critics allege that instead of leveraging the generative tension of social conflict in diverse neighborhoods, the public process “created an illusion of inclusion while reifying existing unequal power relations” (Roy, 2015, p. 65).

Importantly, the Atlanta Beltline project also offers valuable insights about critical self-reflexivity on the part of ecological resilience practitioners and researchers. In the beginning, Ryan Gravel initiated the project as his master's thesis in urban planning at Georgia Tech, which he completed in 1999. As the project took off and its reputation spread, he became a sought after speaker among environmentalists seeking to reduce sprawl through smart growth and biophilic design. In October 2014, he presented the Atlanta Beltline project as part of a panel on “Urban Renewal and Resilient Design” at the popular environmental conference, South by Southwest Eco (SXSW Eco). As a white man on an all-white panel, before an almost exclusively all-white audience of environmentalists, he presented the history of his project within the longer history of urban sprawl in Atlanta and highlighted opportunities to reclaim abandoned spaces in the city through resilient design – places where “we” want to live (Walsh, 2015).

Unfortunately, his presentation failed to advance the possibility of resilience for all in three key ways. First, his accounting of the costs “we” have incurred through subsidized sprawl said nothing about the structural racism underlying policies that drove suburbanization and urban renewal, setting out a blueprint for segregation in Atlanta from 1949 to 1961 (Holliman, 2010). Second, as a white man before a room of overwhelmingly white leaders, his well-intentioned use of the inclusive word “we” served to reify

existing exclusive structures of power instead of disrupting them. Third, in outlining his prescription for ecological resilience, he did not present a plan to prevent vulnerable inner-city communities from environmental gentrification as new people with economic privilege flocked to ecologically restored, attractive places near the urban core (Walsh, 2015).

Most peculiarly, at the time, the Atlanta Beltline project was one of the only green infrastructure projects in the country to have explored an equitable development plan. It was the only large scale green infrastructure project to have successfully implemented a tax increment financing policy to fund an affordable housing trust fund that would support residents under gentrification pressure. These policies were part of a larger, path-breaking Beltline Equitable Development Plan authored by Nathaniel Smith in partnership with Atlanta BeltLine, Inc. Both as Vice Chair of the BeltLine Tax Allocation District Advisory Committee and as an Atlanta Beltline Partnership Board Member, Nathaniel Smith – the Chief Equity Officer of the Partnership for Southern Equity (PSE) –worked tenaciously for implementation of the Equitable Development Plan.

Gravel was well-aware of these policies (Gravel, 2014). Yet, when asked at the end of the panel presentation why he did not mention these innovative strategies for socially and ecologically resilient design, Gravel explained that he had to “consider his audience” (Walsh, 2015).

Instead of helping to empower a packed room of white environmentalists with insights and tools to support socially diverse, resilient communities for all, he chose to omit discussion of race, racism, segregation, gentrification, and equity from the conversation. Perhaps this was a result of past conversations with white environmentalists having gone poorly, due to the pervasiveness of white fragility as a phenomenon that prevents open conversations about racism. Perhaps, guided by a social value of color-blindness, he used “we,” blindly assuming it was an inclusive word that means “all lives matter.”

Unfortunately, as planning theorist Marcuse (2015) notes, use of one-dimensional conceptions of terms (such as “we” and “resilience”) implicitly endorse the status quo when their underlying assumptions are left unexamined. Such implicit endorsement in public discussions can have a real impact on policy design and implementation “due to the subliminal impact that resides in what the words imply” (Marcuse, 2015). Similarly, American studies scholar Lipsitz (2007) challenges design professionals and citizens interested in the built environment to interrogate these assumptions so that they might “disassemble the fatal links that connect race, place, and power.” He asserts that an unexamined “white spatial imaginary” often guides land-use decisions and policy practices in ways that privileges the pursuit of private property accumulation for the few over the pursuit of happiness and well-being for the broader public (Lipsitz, 2007). By failing to address these unexamined assumptions and paradigms of economic development through the planning and implementation process of the Atlanta Beltline (Roy, 2015), and in public presentations about the importance of the project for resilient design (Walsh, 2015), Gravel implicitly endorsed those assumptions and affirmed them for others. In doing so, the project was constrained in its capacity to generate resilience for vulnerable communities in Atlanta, and in other places seeking to replicate their successes.

The good news is that two years later, through dialogue with Nathaniel Smith and self-reflection on his fundamental commitment to his family, city and BeltLine legacy, Ryan Gravel demonstrated his leadership as a bold advocate for equity, working in partnership with collaborators committed to social and racial equity. On September 26, 2016, Gravel and Smith resigned from the Board of the Atlanta Beltline together, saying not enough emphasis was being given to the issues of equity and affordability. “I believe in the BeltLine,” Gravel told a reporter, “I believe it can be for everybody. I don’t believe it’s too late” (Saporta, 2016). Despite resigning with a heavy heart, he and Smith felt they needed to shine a spotlight on the urgency of the issue and step outside, into independent roles where they could become more involved as advocates. In response to their action and advocacy, the BeltLine’s CEO was forced to resign under public pressure and the BeltLine appointed a new Chief Equity Officer.

Today, Gravel serves on the Board of PSE, supporting its work to advance equity in a region “riven by racial, economic and class disparities” through an “ecosystem-based model for multi-demographic engagement” (PSE, n.d.). PSE recognizes that broad-based, intersectional coalitions are essential to support adoption of just, sustainable practices and policies for shared prosperity. Projects like the Beltline have the potential to catalyze a just transition to a more regenerative economy, but only when they are grounded in larger social movements for systemic change. Although Gravel notes that the Beltline has unfortunately become “a convenient proxy for blame about the city’s larger lack of preparedness for growth,” he also points out that it is “the only transit project in the region that comes with built-in relationships across a spectrum of public agencies and nonprofit partners to support the project on everything from affordable housing to economic development, job creation, and public schools” (Gravel, 2018). When popular resilient design projects center equity and partner with movement leaders, they can help support the intersectional coalitions and social movements that drive systemic change.

Movements for equity in the region supported by PSE have led to some advances in affordable housing policy. First, the city required developers using public subsidies to include more affordable units (Wheatley, 2017). Then, Councilmember Andre Dickens introduced inclusionary zoning legislation that was passed by City Council in November 2017. It mandates that developers building new residential rental units near the BeltLine or Westside District set aside 10 percent of those units as affordable to households at 60 percent or below Area Median Income (AMI) or 15 percent of those units for households at 80 percent AMI or below. These programs also supplant an earlier policy that provided seniors on the Beltline with owner occupied home repair funds (Kelley, 2017). In reflecting on the ever-unfolding story of the Atlanta Beltline and the leadership of an individual scholar-practitioner of ecological resilience working in tandem with grassroots movements, what lessons can be drawn for scholars and practitioners working to develop frameworks for building social and ecological resilience in vulnerable communities? In the face of extractive economic systems buttressed by entrenched power structures that have generated conditions of vulnerability for frontline communities, how can ecological resilience researchers meaningfully advance equitable ecosystem management? How can their work make equitable ecosystem management synonymous with economic development, where the governance of resources in our common home is equitably conducted for the well-being of life in its full diversity? How can more cities take on resilient design efforts that build upon

the social and ecological diversity of neighborhoods through developmental process that support regeneration and well-being for all, without displacement?

4. Panarchy and the paradox of vulnerability and power

Despite the limitations of ecological resilience theory and practice reviewed above, the body of research on resilience in social and ecological systems offers pragmatic contributions to those working on the ground to advance the viability, vitality, and adaptive capacity of vulnerable communities. Community organizers working in vulnerable communities affected by environmental injustices are increasingly looking to advances in complexity theory and ecological resilience research to inform their local efforts (Boggs & Kurashige, 2012; Brown, 2017; MG Justice & Ecology Project, 2017; Wilson, 2018). Descriptive theories of ecological resilience support deeper understanding of the complex dynamics of living systems. Movement leaders and community organizers particularly draw upon theories about fractal patterns (patterns that are self-similar across different scales) and panarchy (through which changes in one part of a system may catalyze change throughout a system). These theories offer scientific grounding for the bottom-up, transformational work of frontline community organizations.

4.1. Panarchy: A theory of change in living systems

Originating in evolutionary resilience research, panarchy holds that all social-ecological systems exist and function at multiple scales of space, time and social organization, and the interactions across scales fundamentally shape the dynamics of the system at any particular focal scale (Gunderson & Holling, 2001). Thus, relatively small changes in one part of a system at one time can fundamentally shift the dynamics of other parts of the larger systems. As community organizer and philosopher Boggs (2007) explains, “change takes place in living systems, not from above but from within, from many local actions occurring simultaneously.”

The idea that immediate, small-scale local actions can have long-term, large-scale effectiveness is central to research on complex systems and has been increasingly recognized by scholars in urban planning (Hamdi, 2004; Wilson, 2018) and community organizers (Brown, 2017). Moreover, when people can make sense of the dynamics of the complex systems they inhabit, they are more likely to identify leverage points (Meadows, 1997) or acupuncture points through which they can strategically intervene through small actions that generate ripple effects throughout the systems to which they are connected.

Applying the principle of panarchy to the nested nature of personal resilience also draws awareness to the importance of reflective practice on the part of individual researchers. Each individual human is, itself, a complex living system. Not only does it contain a multitude of interdependent organs and circulatory systems, it also contains a multitude of identities, patterns of thought, and lived experiences (Powell, 2015). Many social justice leaders bring attention to the fact that “how we are at the small scale is how we are at the large scale”, implying that “how we practice at the small scale affects the whole scale” (Brown, 2017, p. 52).

This presents both a risk and opportunity for ecological resilience researchers. The risk is that if we show up in communities without critical self-awareness and capacity for intentional adaptation, our fragility and habitual reactivity may create more harm than good. On the other hand, if researchers develop the capacity for critical self-awareness and authentic, collaborative engagement, how we practice at the small scale can contribute positively to the whole scale. When researchers build their capacity for emotional resilience when engaging in contexts rife with social tension, we are more capable of supporting larger social systems in doing the same. Moreover, drawing from Meadows’ theories of leverage points, if we as individuals can shift our own consciousness, we have the potential to inspire a larger paradigm shift in the overarching systems as we engage with others (Meadows, 1997). Through practices of intentional adaptation, as social systems begin to self-organize around newly chosen mindsets, emergent processes are more likely to produce desired outcomes (brown, 2017).

4.2. The paradox of vulnerability and power in conditions of precarity

The self-reflective work required to build individual, social, and ecological resilience is necessarily disruptive and unsettling, before it is creative and generative. Or rather, true to “resilience thinking” at any scale, researchers will move through these cycles of creative destruction and release, reorganization and regeneration, innovation and growth, and standardization and conservation if they are engaging in resilience praxis (Walker & Salt, 2006). This work also points to the important paradox of vulnerability and power at the heart of socially just ecological resilience praxis.

Typically, Western understanding of identity, vulnerability, and power suggest that power is a zero sum game, where 1) those who have it use it to their advantage, 2) those who don’t have it are vulnerable to the whims of those who do, and 3) as soon as one demonstrates vulnerability, someone else will usurp the power once held. To succeed in this game, one works to amass power, watches one’s back, keeps one’s cards close, and protects one’s self and close kin to the best of their ability.⁴

Vulnerability shifts from a position of weakness to one of power when we accept the nested living systems view of a multiple and relational “self” described previously. From this lens, power is the capability of a living system (individual, community, ecosystem) to heal itself and create conditions of vitality, viability, and adaptive capacity. Instead of a zero-sum game, those who have the power to

⁴ This kind of power dynamic is described by Otto Scharmer in *Theory U* as “absencing,” wherein leaders become stuck in one truth/view, an “us v. them” mentality, and one position (Scharmer, 2009). In this political environment, as Flyvbjerg (1998) has argued in *Rationality and Power*, political power trumps rationality and science and impedes the potential of democracy.

renew, adapt and thrive know that 1) their well-being depends on that of others, 2) their capacity to adapt to change depends on collective capacity to understand system dynamics, and 3) their own willingness to vulnerably engage with an open mind, open heart, and open will is essential to creating the foundations of mutual trust and reciprocity required for effective collective governance of their common home. Human beings are rarely willing to give up power or be vulnerable. Yet to succeed in a game of regeneration, one builds power by relinquishing control and engaging in relationships of trust, integrity, and mutual care.⁵

Privileged resilience researchers must be willing to step beyond our comfort zones and risk our privileged positions of power, if we are to disrupt economic structures that systemically produce vulnerability. When someone in a community names the existence of “white supremacy,” we must help others (ourselves included) be more offended by the fact that its vestiges remain in our communities than the idea that someone would use the phrase, or that we might be complicit in its existence.

We may also consider reframing the way we conceptualize vulnerability in our work. We might recognize that in the age of the Anthropocene and climate change, life for us all is precarious, but frontline communities experience precarity: a “politically induced condition in which certain populations suffer from failing social and economic networks of support and become differentially exposed to injury, violence, and death” (Butler, 2010, p. 25). We might embrace vulnerability as a way to employ the faculties of the open mind, heart, and will, required to collectively address the precarity experienced by frontline communities. In this way, vulnerability becomes an access point for building the power required to dismantle economic structures producing precarity and to create new economic structures that support the wellbeing of the beloved community in its full diversity for generations to come.

5. Resilience: From a neutral state to resistance and regeneration

“Neutrality helps the oppressor, never the victim. Silence encourages the tormentor, never the tormented. Sometimes we must interfere.”— Elie Wiesel.

Limitations and challenges notwithstanding, there are excellent opportunities to apply concepts of ecological resilience in the work of building social and ecological resilience in frontline communities experiencing conditions of precarity. To do so, however, resilience researchers must recognize that they, too, are part of the living systems they study. As such, *their presence in these systems is always consequential, never neutral*.

Given that neutrality is not an option, they must not only operationalize resilience, but also problematize their understanding through critical reflection. They must cultivate their own capacity for emotional resilience in the face of social conflict in diverse communities, and realize that it is only through being racially conscious that they can be racially neutral in action (Wilson, Walsh, & Bush, 2018, Walsh, 2016).

Finally, if they are committed to supporting the resilience and well-being of frontline communities, they must give up their role as neutral observers and work *with* community leaders and coalitions to *actively intervene* in the living systems they observe. Methods from critical participatory action research (Kemmis & McTaggart, 2005; Reason & Bradbury, 2007; Reason & Canney, 2015) and community-based participatory research (Israel, Eng, Schulz, & Parker, 2005; Minkler, 2010; O’Fallon & Dearth, 2002) – especially as used in environmental justice scholarship (Angotti & Sze, 2009; Corburn, 2005) – offer a strong methodological foundation. Through transdisciplinary, community-driven action research, researchers can work to resist economic systems producing conditions of precarity, and draw on their ecological knowledge to create regenerative economic systems that co-produce social and ecological well-being.

When practice researchers of ecological resilience start by asking “resilience of what, for whom, by whom?” and choose to work directly with community-based organizations in vulnerable communities, they can combine their scientific knowledge and networks with the local, contextual knowledge and networks of partners to identify such leverage points and design interventions. Through the same process, they can cultivate the ecological literacy and systems-thinking capacity of engaged change agents. *The call to action, then, for resilience researchers is to shift the power imbalances involved in resilience planning and support frontline communities in their ongoing efforts to build social and ecological resilience*.

There are, thankfully, many success stories to learn from and growing movements for climate justice in which resilience researchers can support the work of resistance and regeneration. For instance, in *Resilience for All: Striving for Equity Through Community-Driven Design*, Wilson (2018) offers four deep case studies and four smaller vignettes of transdisciplinary, community-driven resilient design initiatives that have creatively disrupted and restructured social and ecological form and functions to enhance community well-being and adaptive capacity in frontline communities. In each case, local residents in vulnerable communities collaborated in transdisciplinary action research teams with experts in ecology, urban planning, architecture, and design to initiate microprojects designed *with equitable systems change in mind*.

Although the contexts and projects were diverse, many patterns were consistent. First, experts involved in the community-driven projects recognized that understanding the ways in which inequitable structures had shaped the urban fabric over time was essential to building ecological literacy in the places in which they were working. They listened to their community partners, built trusting relationships, and together they designed interventions informed by collective understanding of the particular dynamics of the place. Drawing from the experiences of these initiatives, Wilson (2018, pp. 8–9) asserts:

⁵ This kind of power dynamic is described by Otto Scharmer in *Theory U* (2009) as “presencing,” wherein leaders engage openly and vulnerably with curiosity, compassion, courage, and commitment to the well-being of self, “other,” and larger ecosystems. This kind of vulnerability is also the basis of power described by Brown (2012) in *Daring Greatly: How the courage to be vulnerable transforms the way we live, love, parent, and lead*, and by Hanh (2008) in *The Art of Power*.

If placemaking projects aspire to contribute to positive change in vulnerable communities, the assets, needs, and wisdom of community residents must be a driving factor in the design and implementation processes. Structural racism cannot be eradicated by one small design intervention, but not considering existing and potential inequalities when changing the urban fabric of lower-income communities implicitly perpetuates systems of oppression.

These small-scale, intentional actions not only changed the material environment; they also shaped the awareness, attention, and commitments of participants. Additionally, Wilson notes that small scale, playful, engaging, accessible hands-on activities that invite diverse, intergenerational residents to be creative together “often up space for hopeful dialogues about the future of the community, even in stressful environments” (Wilson, 2018, p. 172). Moreover, as actions emerge out of such trusting, creative, spaces, this active hope creates new material realities, lived experiences, and community capacities. As community organizers from Movement Generation note, “what the hands do, the heart learns” (MG Justice & Ecology Project, 2017).

In all of the case studies in *Resilience for All*, outside experts also engaged in the essential work of relationship building. They worked to develop authentic, trusting relationships with diverse community partners, as well as internal and external resource networks. Like the Atlanta Beltline case, these projects revealed the importance of building and participating in coalitions in order to shift power structures and advance equity across larger focal scales.

Additionally, the projects reflected an understanding of the coupled nature of social and ecological systems, including the co-production of social and ecological harm produced through extractive and exploitative economic structures. Collaborators with strengths in systems-thinking, asset-based community development, and ecological design helped their communities understand the relationships between these systems, identify assets and leverage points, and develop creative, engaging intervention strategies to co-create social and ecological well-being. Despite being small in scale and scope, these microprojects were successful in catalyzing change, both because of the strength of community relationships and integrated design process that created them. As Boggs (2007) asserts:

Changes in small places affect the global system, not through incrementalism, but because every small system participates in an unbroken wholeness. We never know how our small activities will affect others through the invisible fabric of our connectedness. In this exquisitely connected world, it's never a question of 'critical mass.' It's always about critical connections.

Although we may never know the full extent of impacts, resilience researchers can support processes of intentional adaptation by providing system feedback in the course of transdisciplinary action research. The strengths of organizers on the frontlines and that of researchers from diverse disciplines can support a synthetic framework for transdisciplinary, community-engaged, place-based, action research that builds resilience in vulnerable social and ecological communities. When the contributions of ecological resilience research are integrated with frameworks for critical participatory action research, environmental justice, and regenerative design, action researchers can work with community partners to advance resilience through both resistance and regeneration. In an interconnected world, increasing the resilience of vulnerable communities will ultimately support resilience throughout living systems.

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