

## **Shades of Becoming Toward Regenerative Futures: Revelatory Purposes and Process in Sustainability Education and Public Pedagogy**

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### **Abstract**

The daunting complexities of the apocalyptic present compel new pedagogies for learning, action, and change toward regenerative futures. This paper explores how areas of convergence and emergence between public pedagogy and sustainability education reveal purposes and processes that enable individual and collective experiences of regeneration. Specifically, the paper considers how features of sustainability education, realms of sustainability change, and forms of public pedagogy can be linked to elements of regeneration. The paper presents a theoretical framework that leverages the metaphor of different shades of becoming to capture the experience of regeneration through a dynamic and iterative process of un-becoming, re-becoming, and becoming. Ultimately, the paper suggests implications for how public pedagogy negotiates apocalyptic challenges, orients both pedagogies and publics toward sustainability, and navigates possibilities to enable regenerative futures.

## Examining the Prospect of Sustainability

The scale and scope of the staggering challenges humanity faces, such as COVID-19, social injustice, and climate change, belie simple classification. But broadly, this overwhelming existential situation can be identified as unsustainable, a state that cannot be maintained and instead requires adaptation, healing, and evolution. Negotiating the demands of present and future challenges will entail a public and pedagogical process to catalyze hope and change in the quest for a sustainable future. Yet public processes and pedagogical approaches remain ill-equipped and misoriented to address this fundamental task. In encountering this imperative, public pedagogy can be bolstered by a closer exchange with the field of sustainability education. Though the two fields demonstrate an intriguing kinship, they have rarely aligned in theory or practice. To further an exchange between the two fields, this paper explores potential synergies between public pedagogy and sustainability education in an effort to reveal purposes and processes for deliberating pathways toward more sustainable futures.

This exchange is particularly relevant amidst a moment when publics have been forced to grapple with devastation and dissolution. The severity of sustainability challenges and their consequences have shaped an apocalyptic era (Berger, 1999) in which the public and pedagogues alike must negotiate the trauma of loss, revelation, and wickedness. In this paper, I frame the complexity of (un)sustainability as a symptom of this apocalyptic era, one with problems to be confronted even if they surpass resolution. Public pedagogy, and society more broadly, have much to deal with in this context. The unprecedented turbulence of escalating and intersecting sustainability challenges has ushered in the age of the Anthropocene (Crutzen, 2006), in which humans have come to drastically shape their environment through technological advances and behavior choices. The “great acceleration” (Steffen et al., 2015) of the ecological impacts of human consumption has exacerbated the fragile stability of communities, including nonhuman ones, around the globe, while accentuating entrenched and mounting issues related to equity and justice. Recognition of these intertwined issues and the need for solutions has led to a rise in the relevance of aspirations for sustainability in policy, practice, and research (Bettencourt and Kaur, 2011), including a global sustainability agenda established by the United Nations (United Nations, 2016). Yet the pursuit of sustainability remains a daunting effort, one imperiled by a lack of serious progress and rapidly encroaching tipping points (Bradshaw et al., 2021).

Amidst the myriad demands of cultivating more sustainable futures, the notion of sustainability requires deliberation to determine appropriate visions for the future. The impetus for sustainability is the observation, gleaned from scientific and social analysis, that the dynamics of social, political, economic, and ecological realms are imbalanced, generating concrete consequences in the present that undermine the capacity for stability and well-being in the future (Kates et al., 2001). However, because sustainability objectives and initiatives are strongly shaped by context and values, the field faces epistemological, conceptual, and normative questions (Nagatsu et al., 2020), which have led to many different interpretations and applications (Glavič and Lukman, 2007). The conceptual framework provided by Leach et al. (2013) synthesizes many standard features from this range of approaches to describe the aim of sustainability as facilitating a balance between preserving ecological limits and maintaining adequate social foundations to ensure planetary and human well-being in both the present and future.

Beyond this overarching *outcome* goal, discourses on sustainability also outline *dimensions of engagement* that demonstrate several *paradoxes*, goals related to the *process* of sustainability, and *principles for action* that encounter *fundamental challenges*. Nagatsu et al. (2020) integrate insights from a range of literature to articulate two primary *dimensions of*

*engagement* in sustainability: (1) appraising and navigating the dynamics of complex adaptive systems, and (2) facilitating transformative (social) change. These two areas of analysis and action highlight the tensions inherent to sustainability as it aims to both conserve and contest present conditions into the future, negotiating trade-offs across cultures, spaces, time, and disciplinary perspectives (Wals, 2010). There are several other *paradoxes* in how sustainability operates and the objectives it proclaims, including

- The pursuit of change and constancy;
- An emphasis on problems and solutions;
- A focus on the present and the future;
- Primacy of the individual and the collective;
- Priorities for human and nonhuman communities; and
- Engagement in local and global realms.

Though these paradoxes complicate how sustainability is understood and applied, the field has established relevant change *processes* that operate within social, political, cultural, economic, and ecological realms. These processes seek to: (1) re-structure institutions and the ways they shape sustainability behaviors; (2) re-connect to nature and the human-nonhuman interactions that nourish sustainability values; and (3) re-think knowledge production and how it cultivates sustainability mindsets (Abson et al., 2017). These processes suggest that sustainability is more than a cognitive-intellectual or psychomotor-behavioral learning endeavor; it is also an affective-motivational endeavor that requires appropriate attitudes and willingness to participate in individual and collective action (Frank, 2021). However, the processes also highlight some of the tensions in sustainability discourse, particularly the notion to go back to a more “natural” or simple life while also advancing toward more sophisticated ways of thinking, being, doing, and interacting.

Because of the tensions and ambiguities in both what sustainability is intended to achieve as well as how it does so, the *principles for action* in the field also exemplify complexities that undermine the ability to theorize and practice sustainability. Norström et al. (2020) emphasize the goal-oriented, pluralistic, context-based, and interactive nature of undertaking sustainability change processes. While these principles delineate a pathway toward change that is normative, participatory, and dynamically responsive, they struggle to surmount several *fundamental challenges*. These challenges blend practical and theoretical considerations and serve to frustrate how the field becomes accessible and actionable to a range of audiences. These challenges include: (1) high levels of complexity and uncertainty; (2) the ambivalence of sustainability goals that creates conflicts in values and interests; and (3) difficulties in implementation and evaluation (Newig et al., 2013). The principles described above attempt to address these challenges by making sustainability endeavors contextual and interactive, aligning with features of public pedagogy, but these approaches do not overcome the broader challenge to synthesize what is being maintained or achieved and how.

Though the complexities, tensions, and ambiguities in sustainability as a concept and practice compromise its efficacy in navigating change toward more sustainable futures, this opacity and uncertainty aligns the wickedness of an apocalyptic era. In this moment, the lack of clarity, and the fear it nourishes, has ensnared humanity in a turbulent journey toward ominous futures. Amidst these trials and tribulations, the discourse of sustainability has value not because it provides concrete solutions but because it offers an approach to grappling with the complexities and challenges of these times. In this paper, I do not aim to resolve the tensions in sustainability nor fully unpack the ambiguities of shifting dualities such as nature-culture. Instead, I present sustainability, specifically its approaches to education, as a

tool for what it means to persist in an apocalyptic era and how to negotiate the public and pedagogical demands that this era has surfaced. I see sustainability as relating to public pedagogy and its aspirations of learning, action, and change in three ways. First, sustainability emphasizes deliberation of both normativity and disruption (Hammond, 2020). Second, sustainability emphasizes social-ecological embeddedness and engagement (Fazey et al., 2018). And third, sustainability emphasizes existential and critical hope to navigate the realities and possibilities of learning, action, and change (Ojala, 2017).

In charting these realities, sustainability positions the outcomes it seeks to facilitate along a spectrum of possibilities. The spectrum of these possible outcomes entails an overlapping and nonlinear progression through resilience, transformation, and regeneration (Zanotti et al., 2020). The first of these is resilience, which encompasses the capacity of a system to experience shocks and still retain its structure, function, and identity (Walker and Salt, 2006). Aiming to foster broad social-ecological resilience can facilitate sustainability, yet that sustainability can be the maintenance of an inherently unsustainable system. Problematizing resilience (Moulton and Machado, 2019) in the context of an apocalyptic present can reveal power dynamics and social-ecological structures that require not preservation but transformation, suggesting that resilience is not an adequate means or end for sustainability or public pedagogy. Instead of the fixed, restorative approach of resilience, transformation seeks fundamental change and proceeds in an open-ended yet vulnerable fashion. Achieving transformation in the pursuit of sustainability involves assigning normative values in the appraisal of future options and anticipating potential pathways and consequences of change (Redman, 2014). However, though a transformative approach enables the quality of change necessary to pursue sustainability, transformation remains a means but not an end in this process, for it too cultivates ultimately static products.

What is needed beyond resilience or transformation is the possibility of regeneration. As a guiding principle in diverse fields such as agriculture (Rodale, 1983), architecture (Lyle, 1996), and many others, regeneration has been defined and applied in many ways. Here, inspired by the discussion in Isaacson (2020), I consider regeneration as describing a living system of human and nonhuman elements, organized by its impulses to be restorative, self-reinforcing, and incessantly adapting, healing, and evolving. In the context of regeneration and sustainability the implications of these processes need to be questioned, particularly the dynamics between human and nonhuman communities as well as the normative assumptions guiding how social and ecological health might be defined. The process of regeneration acknowledges these implications not by attempting to resolve them but surpassing them through an ongoing process of negotiation. In this way, the process of enabling regenerative futures involves interactive adaptability and the co-evolution of human and nonhuman communities (Camrass, 2020). These capacities stem from deeper and layered understandings of reality, richer stories of place, and holistic and integrated notions of time (Camrass, 2020). Regeneration unfolds as adaptation to the demands of an apocalyptic present, healing from this effort to establish an ability for further change, and evolving in dynamic and sustained ways. In the pursuit of sustainable futures, regeneration acts as both a means and an end. It also provides a frame for the aspirations of sustainability education and how it can support public pedagogy to navigate the apocalyptic present.

### **Encountering Problems and Possibilities in Public Pedagogy**

The discourse on sustainability reveals the complexities that public pedagogy needs to engage with in an apocalyptic world. Sustainability education has been positioned to facilitate this process, acting as a driver of individual and collective transformation (Sachs et al., 2019) by developing in learners the necessary awareness, knowledge, competencies, and motivations

for sustainability problem-solving (Brundiens et al., 2021). By reimagining and reconfiguring educational processes and purposes, sustainability education can serve a pivotal function in reorienting social-ecological systems toward sustainability and regeneration (Taylor et al., 2017). Beyond this pedagogical function, sustainability education can also serve a public function as a process that engages learners in revitalizing the social and ecological commons (Bowers, 2017). Reviewing the purposes, processes, and possibilities of the range of approaches to sustainability education can help to expand on these essential features and make connections to public pedagogy.

Sustainability education is a diverse and multifaceted field that aims to link educational processes, across different levels and settings, to the cultivation of sustainable futures. Practice in the field has aimed to catalyze learners to think critically about the systemic causes of sustainability problems, work collaboratively to develop solutions to those problems, and incorporate values to envision how those solutions can contribute toward action in creating more sustainable futures (Wiek et al., 2011). Approaches to sustainability education seek to develop critical thinking abilities as well as skills to devise solutions (Vare and Scott, 2007) by engaging learners' head, hands, and heart in transformative learning (Sipos et al., 2008). Pedagogies aim to foster experiential, reflexive, and applied learning (Barth and Michelsen, 2013) that integrates both process- and future-oriented (Sterling, 2001) and inter- and trans-disciplinary (Vincent et al., 2016) methods. Through these various approaches, influenced by the context and values embodied in educational settings, sustainability education has become a meaningful strategy in addressing issues in social-ecological systems while also supporting the subjectification (Biesta, 2015) and personal flourishing of individuals (Holfelder, 2019).

Other approaches that overlap with sustainability education, and are particularly relevant in connection to public pedagogy, include ecojustice education, ecopedagogy, indigenous ways of knowing, and place-based education. Ecojustice education attempts to remedy social-ecological problems by fostering in learners an embodied connection to the earth, as well as mutual care among humans and the more-than-human world (Martusewicz and Johnson, 2016). Similarly, ecopedagogy promotes transformative action and interaction toward ecologically and educationally beneficial outcomes (Kahn, 2008; Misiaszek, 2015). These approaches position themselves as "pedagogies of responsibility" (Martusewicz and Edmundson, 2005) that address problematic system dynamics in order to nurture flourishing among human and more-than-human communities (Cuomo, 1998). Indigenous ways of knowing play a foundational role in exploring connections and possibilities between learners and the world around them, particularly by decolonizing pedagogical and public perspectives (Tuhiwai Smith et al., 2018; Tuck et al., 2014). Place-based education can also pursue decolonization and the reinhabitation of natural and cultural commons by engaging learners in critical examination of the spatial aspects of social experience (Gruenewald, 2003; McNerney et al., 2011). These different approaches provide a robust connection between sustainability education and public pedagogy, offering a "dialogical and imaginative starting point for opening up spaces for what is otherwise denied or ignored" (Martin and Brown, 2013, p.381), such as learners' embeddedness in social-ecological systems and more-than-human communities. The range of approaches to sustainability education provide public pedagogy with inspiration and insight in how to grapple with the fallout of an apocalyptic world and cultivate regenerative futures. However, in order to participate in the exchange between these two fields, public pedagogy must also wrestle with challenges within its own field.

The first challenge to address is the notion of the public. As intersecting crises distort conceptions of publicness, not only is the notion undermined but so is the pedagogical potential of the public to drive change. The pressures of a globalized, interconnected, and rapidly

transforming world have disrupted how publics interact, how teaching and learning occurs, and what collective goals publics pursue (Croucher, 2018). With mis- and dis-information compromising respectful engagement and interaction in contested publics (Rubin, 2019), the imperative to reflect on what the public is, what it is for, and what participation looks like becomes increasingly challenging yet critical (Savage, 2010). Articulating a multifaceted conception of the public remains elusive, but is a quest to be embraced rather than overcome.

The second challenge is managing the public as a physical place and space. Biesta (2012) has identified that public pedagogy faces emergent contradictions related to the public's physicality in addition to tensions in the pedagogical enactment of the public as a space for human togetherness. Everyday realities have become characterized by digital communications, social distancing, looming uncertainties regarding safe physical and personal interactions, and further redefinitions of space and interaction. The altered modes of common being have both tethered people to specific places and disconnected them from the features that once bestowed those places with their essence. The nature of places is also being rapidly modified by environmental degradation and the startling impacts of the climate crisis, which further push people away from natural and public places. While place-making has been a key area of exploration for public pedagogy (Loopmans et al., 2012; Schuermans et al., 2012), it seems that prevailing trends are reconfiguring the meaning and setting of these spaces in a process of *displace*-making. As publics struggle through changing environments (ecological, social, technological), ruminating on the nature of public places and spaces becomes increasingly necessary.

The final challenge concerns the enactment of the public, particularly framed as a discourse that embraces plurality and togetherness (Biesta, 2012). Contentious political, social, cultural, and economic relations have undermined the ways in which citizens create publicness. Amidst the rise of nationalism, white supremacy, anti-intellectualism, and neo-fascism, a public formed in orientation toward political liberation and structural transformation has instead become inclined toward disintegration (Giroux, 2017). Disturbances of democracy have subverted the purposes of interaction and the processes of enactment through which publics emerge. This political-cultural setting presents brash opposition to Biesta's (2012) ideal of plurality, togetherness, and freedom. But seeking to engage with this conflict remains a crucial endeavor for public pedagogy.

Addressing these challenges will entail three tasks for public pedagogy in which the various approaches to sustainability education can provide an initial response. The first is remaking the public as a space for resistance, participation, and creation. This task will require "productive destabilizations and spaces of discomfort" (Burdick and Sandlin, 2013, p.161) that contribute to forming "dynamic, dialectic, and political spaces through which new visions can and will be forged" (Savage, 2010, p.104). Critical pedagogies in sustainability education can support this by creating a "performative dimension" (Martin and Brown, 2013, p.381) for citizens to "have some direct bearing on the well-being of the social and ecological places" that they inhabit (Gruenewald, 2003, p.4). The second task is to refocus attention to preserving the ecological systems and environments that underlie public places and spaces. Climate change, biodiversity loss, pollution, deforestation, and other consequences of ecological devastation have created the need for publics to consider how to implement "rapid, far-reaching and unprecedented changes in all aspects of society" (IPCC, 2018). This task will require deliberation of what aspects of the commons need to be conserved and renewed, in addition to subverting the traditions and values that reproduce social-ecological harm (Bowers, 2006). The third task is redefining public and pedagogical aspirations to more strongly emphasize equity, justice, and sustainability. This will include "loving the mess" of the tensions, plural-

ity of values, and complexity of sustainability (Kenter et al., 2019). Sustainability education can infuse public pedagogy with new potential in engaging with these tasks.

### **Aligning Sustainability Education with Public Pedagogy**

The tasks described above provide a map “to both question and enact change” (Sterling, 2016, p.212) as public pedagogy responds to the challenges and complexities of the apocalyptic present and its dire trajectory. Sustainability education can inform public pedagogy to make progress on these tasks while navigating the dynamic and demanding context it is confronted by in endeavoring toward regenerative futures. Specifically, sustainability education can help to clarify the processes and purposes of public pedagogy by:

1. supporting the field to take seriously the social-ecological systems, commons, and more-than-human communities that publics operate within;
2. problematizing existing structures and systems through a trans-dimensional (ecological, social, economic, political, cultural), trans-temporal (past, present, and future), and transformative lens; and,
3. providing insights for envisioning pedagogical pathways toward equity, justice, and ecological responsibility by revealing embodied connections to, and responsibility for, places, people, and the planet.

To explore potential synergies, I consider areas of divergence, convergence, and emergence between public pedagogy and sustainability education. The two fields diverge in relation to purpose, pedagogy, and process. With regards to purpose, sustainability education often positions itself as solutions-focused, aiming to gear education toward the generation of transformative outcomes aligned with increased sustainability (Miller et al., 2011). Achieving this objective commonly entails public interaction, but this is leveraged as a mode for individual and collective learning. In contrast, public pedagogy emphasizes the process of enacting human togetherness as a goal in itself (Biesta, 2012). Though public pedagogy can still adopt a goal-driven trajectory (see the description of pedagogy for and of the public in Biesta, 2012), at its ideal, public pedagogy sheds outcomes-based orientations to instead construct spaces for participation, resistance, and creation to occur (Rosario, 2015; Sandlin and Milam, 2008).

The two fields also diverge in pedagogy and process. Public pedagogy embraces fluid and messy learning situations (Savage, 2010) that become embodied and relational (Burdick and Sandlin, 2013). The pedagogical act is often not implemented but channeled through public artifacts, spaces, and discourse that subvert, divert, and convert public experiences toward learning. Meanwhile, sustainability education has typically been more instructional, tethered to standard conceptions of teaching and learning, even while seeking to transform their practice and purpose toward instrumental and emancipatory ends (Wals et al., 2008). Though sustainability educators have begun to explore more fluid, messy, embodied, and relational approaches (see Goebel, 2020), the field has remained at least somewhat reliant on applying more traditional pedagogies in new ways. Finally, the two fields diverge on matters of process, considering the contexts and mechanisms through which they are operationalized. Where sustainability education has pervaded formal education discourses through policy initiatives (UNESCO, 2015) and a focus on competency development (Wiek et al., 2015), public pedagogy often operates in nonformal spaces to cultivate experiences of complexity, interrelationship, and possibility (Burdick and Sandlin, 2013).

Sustainability education and public pedagogy converge in several meaningful ways that demonstrate their compatibility. Exploring these areas of convergence can suggest how the two fields might intertwine in synergistic ways to facilitate the possibility of regenerative fu-

tures. First, the two fields act in inter- and trans-disciplinary ways that facilitate critical and participatory action to consider issues pertinent to social-ecological systems. Second, both fields seek to link individuals to collective interactions and interests in order to cultivate opportunities to address systemic challenges and the problematic structures that engender them. Third, by prioritizing reflection, engaging with values, and promoting agency, both fields aim to generate personal and social development while respecting interdependent ecological and social communities. These areas of convergence chart boundaries for sustainability education and public pedagogy to align within while still retaining their unique approaches.

The areas of convergence provide a foundation for the emergence of pedagogical approaches that blend unique insights from the two fields. Here, public pedagogy can be infused with principles from sustainability education in order to generate the potential for enacting public togetherness, articulating innovative and impactful pedagogies, and advancing toward sustainable futures. Sustainability education scholars Wals and Rodela (2014) describe three features of learning pathways toward transformative and regenerative sustainability, explaining that the pathways should be:

1. counter-hegemonic, by exposing and questioning stubborn routines;
2. transversal, by involving individuals, groups, and collectives; and
3. profound, by affecting moral standards and value systems.

These features reveal emergent possibilities for reorienting purposes and processes in public pedagogy toward sustainability. In the next section, I present a theoretical framework to guide this work.

### **Shades of Becoming**

Reconciling sustainability education and public pedagogy can enrich potential strategies for cultivating regeneration. To facilitate this process, I articulate a theoretical framework that describes an approach to the experiential process of regeneration as an enactment of human and nonhuman togetherness oriented toward sustainability. The framework intertwines elements of regeneration (Camrass, 2020), features of sustainability education (Wals and Rodela, 2014), realms of sustainability change (Abson et al., 2017), and forms of public pedagogy (Biesta, 2012) to trace an iterative and dynamic pathway toward regenerative futures through three stages, or shades, of learning, acting, and changing: un-becoming, re-becoming, and becoming (Table 1). The shades of becoming offer a metaphor for regeneration, illuminating trajectories toward more vibrant and vital futures. The four theoretical dimensions that the framework synthesizes each offer unique insights. The elements of regeneration focus attention to what must be addressed. The features of sustainability education provide principles for navigating the process. The realms of sustainability change clarify modes of transformation. The forms of public pedagogy establish the relationship between input and outcomes throughout the journey. The rest of this section explores pedagogical purposes and processes embodied in each shade of becoming, while drawing out synergies among the dimensions of the theoretical framework.



Table 1: Intertwining shades of becoming with elements of regeneration, features of sustainability education, realms of sustainability change, and forms of public pedagogy

Dimension	Aspects		
Shades of becoming	Un-becoming	Re-becoming	Becoming
Purpose and process	Publics critically examine <i>reality</i> in order to develop a critical awareness <i>of</i> , and the capacity to challenge, <i>structures</i> and systems in <i>counter-hegemonic</i> ways	Publics embed within specific social-ecological <i>places</i> with new perspectives in order to develop new <i>connections</i> and <i>transversal</i> roles <i>for</i> action and interaction	Publics incessantly evolve throughout <i>time</i> in deliberate and daring ways in order to <i>rethink</i> possibilities for the <i>enactment</i> of <i>profound</i> learning, action, and change
Elements of regeneration (Camrass, 2020)	Reality	Place	Time
Features of sustainability education (Wals & Rodela, 2014)	Counter-hegemonic	Transversal	Profound
Realms of sustainability change (Abson et al., 2017)	Re-structure	Re-connect	Re-think
Forms of public pedagogy (Biesta, 2012)	Pedagogy <i>of</i> the public	Pedagogy <i>for</i> the public	Pedagogy as the <i>enactment</i> of the public

### Un-becoming

The first shade, *un-becoming*, admits that “deconstruction is a prelude to reconstruction” (Jickling and Sterling, 2017, p.1) in striving for regeneration. Publics come to critique the causes and consequences of reality in order to discard the patterns of thought and behavior that inform apocalyptic scenarios. Here, public pedagogy can act as a form of defiance and unlearning (Jaramillo, 2010), which eludes an “enveloping negativity” (Savage, 2010, p.104) that jeopardizes participation in free and democratic spaces by “challenging boundaries, taken-for-granted norms, definitions, [and] rules” (Lewis and Khan, 2010, p.35). This can include orienting public pedagogy to contest the dominance of consumption and capitalism (Sandlin, 2005; Sandlin and McLaren, 2010) as primary drivers of unsustainability. Pedagogies engage in counter-hegemonic tactics to appraise flawed social-ecological systems in critical and participatory ways, exposing underlying contradictions in order to manifest alternative narratives of progress and power. Approaches to achieve these objectives accentuate sustainability education’s aims to foster ecological integrity through emancipatory and democratic methods (Shephard and Brown, 2017). They also can help to grapple with the “supercomplexity” of the apocalyptic present through a “therapeutic pedagogy” that offers “a chance of recovering the self” while also looking “forward to new realizations of human being” (Barnett, 2000, p.419).

The shade of un-becoming can also be interpreted as representing a pedagogy *of* the public, as this phase of the experience of regeneration involves a “conscientization” (Friere, 1970) of what is problematic and what might be possible. The development of critical awareness is an initial milestone toward enabling spaces where freedom can appear through open and democratic processes, and where learning can occur in meaningful, authentic, and interrelated ways (Biesta, 2012). Un-becoming activates the formation and reframing of (non) formal learning environments “as social spaces that are constantly being made up, de- and reconstructed by a lively actor-network of heterogeneous materials” (Bauer, 2015, p.624). In relation to sustainability and regenerative futures, these spaces then facilitate realization of the entrenched issues to be negotiated and the strategies to surmount them. Yet, in relying upon publics to divert the apocalyptic present toward regenerative futures, there remains “the

contradiction of asking for solutions from the very creature that caused all the problems in the first place” (Haraway et al., 2016, p.541).

Embracing purposes geared toward emancipation from the habits and assumptions that have flung social-ecological systems toward the precipice of destruction can activate new modes of learning and being. Leveraging the initiation of these transformations can help to undermine the “powerful ensemble of ideological and institutional forces whose aim is to produce competitive, self-interested individuals vying for their own material and ideological gain” (Giroux, 2004, p.74). Instead of succumbing to these forces, public pedagogy that seeks to facilitate un-becoming can contribute to locating political agency within totalizing institutional structures (Giroux, 2000, as cited in Sandlin et al., 2011), while orienting that agency toward sustainability. Processes such as dissensus (Rancière, 2015), which intervenes in everyday patterns to evince opportunities to reconfigure them, or pedagogies of refusal (Tuck and Yang, 2014), which take a generative stance to establish counter narratives, can stimulate the critical consciousness (Freire, 1970) necessary to unpack problematic cultural assumptions. Rather than maintaining, reproducing, forwarding, and reinstating social structures, pedagogies can espouse new purposes that enact publics through deftly subversive processes (Burdick and Sandlin, 2013). These include finding ways to “interject, amplify, and interrupt” hegemonic power discourses (Burdick and Sandlin, 2013, p.145) by forging mechanisms that operate within publics situated as sites of both domination and contestation (Sandlin et al., 2011). By facilitating these processes of un-becoming, public pedagogy enhances its capabilities to surface critical educators and citizens as agents of systemic transformation (Burdick and Sandlin, 2013).

### Re-becoming

The next shade, *re-becoming*, represents a genesis of new and transversal perspectives, roles, and relationships that foster learning and engagement for the public to seek the possibilities of regeneration. This is a phase of reconciliation and redefinition. Crucially, re-becoming entails a closer interaction with inhabited places and spaces by demonstrating reverence and compassion toward underpinning ecological functions. It is an attempt at “repositioning humans as deeply entangled with the earth they damaged” in order to enable “the possibility to see human vulnerability and embeddedness in a shared fate” (Goebel, 2020, p.42). By recognizing the “web of entanglements” (Cooper and Sandlin, 2020, p.441) with places, people, and more-than-human elements, reality and possibility are reconfigured as humans become accountable for the performativity of their actions, as well as the ethical responsibility, impacts, meaning, and agency that emerge from them (Barad, 2007). In order to respond to the obligations that emerge from these interconnections, publics must “first fundamentally change ways of being, then (re)describe the world including education in those terms” (Silova et al., 2018). Developing “resistive and regulatory potential” (Savage, 2010, p.104) can support the capacity to assert a new relationality to the human and more-than-human commons (Barrett et al., 2017).

Under the momentous pressure of apocalyptic times, re-becoming is not only a goal, but a mandate for reflection, nimbleness, and vision. Critical self-examination can foster these essential capacities while contributing to democratic social action (Brady, 2006) and the formation of new perspectives that align with promoting plurality (Biesta, 2012) and sustainability. Here, the public becomes a site of negotiation (Giroux, 2000; 2001), one that can “enable certain imaginations and subjectivities to emerge” (Savage, 2010, p.103) in redefining personal and social development in relation to the more-than-human world. Cultivating these outcomes requires recognizing that pedagogical processes embedded in social-ecological systems and publics are always relational, intentional, and moved by ethical imperatives

(Gaztambide-Fernandez, 2013), such as cultivating sustainability. Defined by these parameters, pedagogical experiences that facilitate re-becoming are “emergent, performative, tenuous, and co-constructed” (Sandlin et al., 2011, p.349). They also create pedagogical hinges (Ellsworth, 2005) of uncanny encounters and transitional spaces, which can expand critical imagination (Burdick and Sandlin, 2013) while orienting it toward regeneration.

### **Becoming**

The final shade, *becoming*, involves seeking to surpass bounded conceptions of time and leverage profound learning toward the enactment of publicness where freedom, togetherness, sustainability, and regeneration can occur. Publics are compelled to embrace that “to be alive and to inhabit a world is to be continually and radically in relation with the world, with others and what we make of them” (Ellsworth, 2005, p.4). Becoming also presents the challenge of appraising and actively seeking to not only respond to but to shape the world. In this task it asks publics “to act purposively in an environment where all bets are off, where everything is uncertain and where everything is challengeable” (Barnett, 2000, p.419). Through the process of becoming publics learn to surrender to this context, brace to negotiate it, and project toward new possibilities for learning, action, and change.

The insights of sustainability education, particularly its recognition of interconnectedness with the more-than-human world, can be valuable in the quest of becoming. Though Biesta’s (2012) account of public pedagogy tends to neglect the more-than-human (Cooper and Sandlin, 2020), others have suggested that public pedagogy, in its pursuit of freedom and togetherness, consider the plurality of all relations, including with the more-than-human (Walter and Earl, 2017). This engagement entails “becoming-with” in common worlds (Haraway, 2016) through acts of “sympoieisis” or “making-kin” (Haraway, 2015). Making the turn toward these types of objectives suggests that public pedagogy builds on the profound, values-activating features of sustainability education in order to rethink trajectories toward the future. Linking the intertwined objectives of individual, social, and ecological flourishing (Gambrel and Cafaro, 2010) and embracing relations with the more-than-human world enables the capacity to stimulate collective action for sustainability (Orr, 2004) and individual subjectification (Biesta, 2015).

Undertaking the types of learning, action, and change compelled by the pursuit of becoming toward regenerative futures requires “emergent, unstable, permanently unfinished pedagogies” (Cooper and Sandlin, 2020, p.437) that are able to adapt, heal, and evolve in the incessant experience of regeneration. This experience is akin to “something not yet but which could be through the struggle to define the conditions of possibility for their realization” (Simon, 1992, p.69). The process of becoming and learning is thus “tentative and ambiguous” (Burdick and Sandlin, 2013, p.157), a “pedagogy of the unknowable” (Ellsworth, 1988). But this process in public pedagogy is also one that creates new beginnings, constructing publicness as potentiality and action through plurality (Arendt, 1958). This potential entails not just spaces for disruption and resistance, but for active creation. These “spaces of creativity”, where possibilities for the individual and the collective are “disrupted and refigured” can establish connections that “help us bridge the boundaries between self and other” (Burdick and Sandlin, 2013 p.159), including the entanglement of the human and more-than-human (Mulcahy, 2012). The experience of regeneration can actualize a “mode of human togetherness which is not after a common ground but rather articulates an interest in a common world” (Biesta, 2012, p.690), including with the more-than-human.

## Toward Regenerative Futures

In this paper I have taken a theoretical approach to bridging gaps between sustainability education and public pedagogy, hoping that this exercise would illuminate ways to engage with apocalyptic times and cultivate regenerative futures. Further work is needed to ground the emergent insights in lived experience and manifest its public and pedagogical meanings. However, I offer a brief hypothetical example of how an individual might *become* to demonstrate what such an effort might reveal.

Emerson is a millennial who has recently moved to a rapidly urbanizing city in the American Southwest for a new job with a large corporation. Each day they visit a local cafe serving fair trade coffee. While waiting for a drink, Emerson discusses with the owner the processes of consumption and production that bring the beans across the world to the cafe. Emerson becomes disillusioned at the complexity of the process and the consequences of a seemingly harmless cup of coffee. They wonder why it has to be this way and why it can't be different (*un-becoming*). Motivated to contribute to the solution instead of the problem, Emerson joins a local environmental action group, starts to spend more time in parks, and makes other personal changes. This helps Emerson to see things in new ways, but it also leads to challenges, such as a higher grocery bill, a broken-down bike, and intense feelings of guilt. It becomes clear why sustainability is so difficult. But Emerson persists in finding new ways to be a part of the community (*re-becoming*). As Emerson's personal changes continue, they find themselves valuing new things. But how these values are expressed is constantly changing since the pressures of the world have only been amplified by the multitude of social and ecological challenges. Yet Emerson responds differently to the world around them, critically analyzing their role in the community, finding meaning in participating in a local climate strike each Friday. Emerson knows the task is not complete, but they feel responsible, capable, and connected (*becoming*). Though climate change, social injustice, and a host of other problems linger and intensify, Emerson feels that they have the vision and diligence to make a difference for the future if only there is the time to do so.

This vignette demonstrates that stimulating and experiencing the process of becoming toward regenerative futures remains a harrowing, perhaps even radical and ultimately ambivalent, endeavor. Charting pathways through the apocalyptic present will exact steep sacrifices that will compel the need to adapt, heal, and evolve. Grappling with this process, and the problems and possibilities of public pedagogy, will require “quite simply to keep working at ways of [becoming] more worldly through focusing upon our entangled relations with the more-than-human world” (Taylor, 2017, p.11). The experience of becoming will thus be one of endurance and resolve that engages both public pedagogy and sustainability education. In this adventure the public may not be where it needs or wants to be, instead mired in apocalyptic times. But the public retains the pedagogical potential to realize that it already possesses what it needs in order to become what it wants to be—if only we are all willing to become again and again.

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