Article

"We Make Our Community": Youth Forging Environmental Identities in Urban Landscapes

Erin Gallay [1,*], Alisa Pykett [2] and Constance Flanagan [3]

1 School for Environment and Sustainability, University of Michigan, Ann Arbor, MI 48197, USA
2 Population Health Institute, University of Wisconsin-Madison, Madison, WI 53706, USA; pykett@wisc.edu
3 School of Human Ecology, University of Wisconsin-Madison, Madison, WI 53706, USA; caflanagan@wisc.edu
* Correspondence: erin.gallay@gmail.com

Abstract: Insofar as race, class, and gender have profound effects on people's environmental experiences, and consequently their activism, the environmental field needs more work on the environmental experiences and insights of groups whose voices have been missing, including youth of color who live in urban areas in the U.S. In this paper, we focus on African American and Latinx students engaged in environmental projects in their urban communities and the impact of such projects on promoting pro-environmental leadership, agency, and behavior. We draw from written reflections and focus group interviews of several hundred 4th–12th graders (majority middle- and high-school students) who participated in place-based civic science projects. Thematic analyses of student responses found that students engaged in work on local environmental issues cultivated an appreciation for the natural world and an understanding of human-nature interdependence and the ties between the local environment and their communities' health. Through taking action with others in their communities, students viewed themselves as contributors to their communities and started to form environmental identities in ways that are not traditionally measured. Findings point to the need for forms of environmental education that are contextually grounded and centered on environmental justice in urban areas.

Keywords: environmental identity; environmental attitudes and behavior; urban ecologies; place-based education; urban education; school-based environmental education; youth; non-WEIRD populations; social and environmental justice

1. Introduction

As pointed out in the call for this special section, environmental psychology is hindered by a lack of cultural consideration [1]. Past studies have largely investigated individual differences in people's environmental identity/beliefs and effects on their pro-environmental behavior and action but have rarely included racial/ethnic minoritized populations, especially those living in disadvantaged communities within Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies. Insofar as race and class have profound effects on people's environmental experiences, and consequently their activism and environmental discourses [2], the field would benefit from work that considers the environmental experiences and insights of groups whose voices have been missing.

In this paper we focus on African American and Latinx students engaged in environmental projects in the urban communities where they reside. N.B. We use the term Latinx as a gender neutral term when referring to more than one person without knowing their gender identity, and the terms Latino/Latina when referring to a specific person with a known gender identity. Based on analyses of their reflections on what they learned in these projects, we argue for the impact of such projects on promoting pro-environmental leadership, agency, and behavior and the intersectional identities young people form through addressing issues of social and environmental justice. As such, it is a departure from past studies that focus on people's connection and emotional attachment to nature

(environmental identity) as a foundation for their pro-environmental and conservation behaviors. Furthermore, insofar as projects take place in urban communities that have been marginalized from the seats of power, youth become aware of how ecological health and justice are linked. Here, the focus on the interdependence of humans with the natural environment in the urban ecology provides a different lens on the very concept of nature and people's relationships with it.

Our conceptual framework weaves together the current landscape in environmental work with an innovative model for environmental education and action. Based on existing scholarship, we start from the assumptions that mainstream environmental organizations have historically focused on engaging white, middle class people in the preservation of wild spaces located away from urban areas, and that the conceptualization of environmental identity and many of the existing environmental education models have emerged from this focus on nature as wilderness. We also hold up the historic and current burden of environmental degradation, disinvestment, and appropriation disproportionately borne by communities of color and low-income communities as well as the long history of environmental justice work led by these communities that draws connections between the environment, community health, and collective action. Given the historical and current context outlined above, we studied an educational model (place-based civic science education) that incorporates an environmental justice approach. This approach connects community and environmental issues of concern in urban areas, holding up youth as leaders in their communities. We were interested in the impact on the environmental identities, attitudes, understanding, and sense of agency among the young people participating in these projects and in the connections they made between environmental and community health. With this model and sample we also hope to broaden the conceptualization of environmental identity and action by including a wider range of voices and landscapes.

In the United States, the image of nature that has dominated in media and mainstream environmental movements is a wilderness to which people go as a respite from the city: pure, wild, unchanging [3]. The framing of human/nature relationships separated from culture and apart from the everyday experiences of most people constrains our ideas about the groups of people who care about the natural environment and are active in sustaining and repairing human/nature relationships [4]. Pearson and Schuldt point out that the dominant imagery of primarily White, middle-class people communing with nature in wilderness and the lack of visuals of the urban ecology can signal that the concerns and perspectives of non-represented groups are not valued, thus alienating those for whom environmental issues are also human issues [5].

In fact, the experience of the natural environment in the urban ecology is vastly different from nature as wilderness. It is more akin to the concept of sustainability science laid out by Di Fabio and Rosen [6], that is, the interwoven fabric of human, environmental, natural, and engineered systems. The natural environment within the built environment is where people live: near highways, oil refineries, and trash incinerators. But that environment also includes rivers running through cities, urban forests, gardens growing in the middle of city blocks, living roofs, and solar arrays. These are some of the ways the young people participating in the projects detailed in this paper experience nature on a daily basis. This sustainability science image of nature also reminds us that ecosystem health and human and community health are inseparable.

A focus on human/nature interactions and relationships in urban spaces raises eco-justice issues insofar as brownfields and toxic manufacturing sites that pollute air, soil, and water are typically located in low-income communities of color [7,8]. These same communities also are more likely to experience heat islands and flooding and, revealing the connection between human and environmental health, to suffer from health problems such as asthma, diabetes, and lead poisoning [9]. For many years mainstream environmental organizations paid little attention to environmental justice work, which resulted in a stereotype that people of color were not interested in environmental issues, when in

fact, mainstream environmentalists did not recognize the issues of people of color as environmental [10,11].

Conversely, many in the environmental justice movement viewed mainstream environmental groups as special interests that valued nature over people and were detached from the concerns of people of color, the working class, and low-income communities. Critics noted that wilderness areas were protected, while other places, typically more urban areas, were ignored by large environmental organizations [12]. After decades of work and criticism from activists in the environmental justice movement, mainstream environmental organizations are now paying attention to the disproportionate environmental burdens borne by minoritized communities as well as to the grassroots organizing and local community efforts of these communities to improve environmental and human health. According to pioneers in the field such as Robert Bullard, environmental justice made people reconsider the environment as the physical and natural world where we live, redefining environmentalism as connected to culture and issues of justice [13]. Nurturing younger generations' sense of connection to and responsibility for this larger whole is imperative, but the concept of and routes to formation of an environmental identity need to be expanded.

1.1. Environmental Identity

Susan Clayton was the first to theorize and measure the concept of an environmental identity, which refers to an individual's sense of connection or emotional attachment to some part of the nonhuman natural world that affects the way that they value, respect, and act toward that world [14]. Not surprisingly, an environmental identity is positively related to time spent in nature [15], and research has documented the formative role of early experiences with nature in nurturing an identification and affinity with the natural world [16]. The psychological role of an environmental identity is similar to the role of other collective identities in that it provides a sense of connection and belonging to an entity or group that is larger than oneself [14] and a motivation to act on behalf of that larger whole [17]. Individuals who identify with the natural world feel a sense of responsibility for and act on behalf of the environment [18] through actions such as their personal conservation behaviors or donating time and money to environmental organizations. For some, environmental activism becomes a core part of their identity [19]. Many who feel an affinity with the natural environment also are concerned about the impact of their current actions on future generations. When parents exhibit such generative concern, it has a positive impact on their own and on their offspring's environmental identity, behavior and involvement [20,21]. In young adulthood, generative concerns become a moral compass with the transition to parenthood rekindling values about the natural world that carry across generations [22].

The environmental identity construct is often measured with a self-assessment scale that has been useful in predicting environmental behavior and both the measure and the theory of environmental identity have been critical to realizing the goals of the field of conservation psychology, i.e., exploring relationships between humans and the natural world that promote human behavior to protect the natural environment [23]. In summary, we value the contributions that this line of work has made to the field.

That said, as already noted, people's understanding, of the very concept and experience of nature is rooted in their social and cultural experience [14]. Thus, in the context of this Special Issue, it is incumbent on all of us to ask: Who is left out of this picture? How can children develop an affinity with nature when they cannot walk to any green spaces? How can environmental identity capture the experience of the natural world for historically marginalized groups who may view the issue primarily through the lens of public health, economics, community engagement, and eco-justice [24]? Might the concept of nature deficit disorder take on new meanings if we consider that spending time in polluted outdoor settings exacerbates one's asthma or that wooded spaces are fraught with

acts of violence against African-Americans and pose very real threats of violence to people of color?

While experiences with nature as typically measured are not afforded to everybody, addressing the connections between issues of social and environmental justice can expand the notion of and pathways to the formation of an environmental identity. By expanding the lens on humans and the natural environment, this Special Issue unsettles settled knowledge [25] about the bases for environmental identity and the motivations underlying actions to preserve the environment.

1.2. Widening the Lens of Environmental Identity and Action

Our understanding of the mechanisms whereby racial/ethnic minoritized groups identify with and get engaged in environmentalism suffers from a paucity of research. Based on their review of extant literature, Medina and colleagues suggest that future research include a broader conceptualization of the environmental beliefs and actions of these groups [26].

Environmental beliefs, attitudes, and behaviors measure people's commitment to environmental well-being but all too often have been focused on behaviors such as visiting national parks [10] and priority actions for consumers [27]. Even "environmental citizenship behaviors" are based around Eurocentric values, such as membership or financial contribution to environmental, conservation, or wildlife organizations. In much of the literature, Pro-Environmental Behavior (PEB) is intentionally measured by focusing on behaviors that directly impact the immediate natural environment [27,28]. This may leave out more activist behaviors intended to influence policy or practice for which there are no means to measure direct impact on the natural environment.

Notably, measures of environmental behaviors overemphasize individual acts of conservation which make less sense in the context of the lived realities of non-WEIRD communities in the U.S. For example, engagement with neighborhood groups opposing tire dumping in the area or industrial point-source pollution of local waterways may be more realistic and impactful actions in some communities, especially for those with little disposable income.

By no means is connection to nature, affinity for wild landscapes, and interests in outdoor pursuits exclusive to certain populations. Environmental beliefs and connection to nature are influenced by many factors and people with different racial, ethnic, and cultural identities live, work, and play in a diverse range of geographic areas and have varied relationships to different landscapes. While not the focus of this paper, BIPOC (Black, Indigenous, People of Color) groups have a long history of environmentalism and connections to nature (see for example Glave's work on the history of African Americans and the environment) [29]. This paper does not aim to limit the scope of environmental beliefs, attitudes, and interests of different groups but rather to widen the lens of environmental identity and agency to account for experiences of young people in urban areas and the intersections of racial and environmental justice.

In the United States, when environmental issues have direct impact on people's communities, ethnic minority groups report greater concerns about climate change and willingness to engage in environmental advocacy than Whites [10,26]. Pearson and colleagues refer to this common misperception as the environmental belief paradox, defining it as "a tendency to misperceive groups that are among the most environmentally concerned and most vulnerable to a wide range of environmental impacts as least concerned about the environment" [10] (p. 12429). Furthermore, they point out that this paradox impedes efforts to broaden public participation in environmental decision making and tackle environmental inequities.

As scholars point out [30–32], people's environmental behavior is determined by more than their own opinion and willingness to act. Furthermore, significant sociocultural conditions, including systemic and structural barriers, impede changes in personal behavior practice (e.g., household energy use). In fact, for many, such as a family with a low-income

living in urban Detroit, there is not much they can do to decrease their carbon footprint. Studies have shown that, due to infrastructure and systemic policies and practices, everyone living in the fossil-fuel powered U.S (including people experiencing homelessness) has an unsustainable footprint [33], much larger than most of the world's population.

That said, through collective ecojustice work, non-WEIRD populations can hold people in power accountable to change the system. In fact, there is a vibrant alternative eco-justice paradigm of environmentalism led by people of color (including youth) and based on the intersections of environmental, economic, and health issues in their communities. Many young activists do not organize around a single issue, but rather work for change that addresses multiple issues where they intersect [34]. Today's environmental justice and youth organizing movements are distinct yet inseparable parts of a larger social justice movement reflecting the fact that large urban areas are where environmental, economic, and societal challenges share common roots. This work shifts the measures of environmental attitudes and concern away from conservation to include perceptions of environmental hazards and risk [10]. New measures of environmental behavior also tap environmental civic behavior, i.e., intentional engagement in positive impact on the environment via collective and political change (see Alisat & Reimer's environmental action scale [31]), and forms of activism held up as the best way to reduce the causes of climate change [30].

1.3. Re-Imagining Environmental Education with a Focus on the Urban Ecology

Scholars have criticized the Western-centric child-in-nature movement as a reductionist romanticization of young people's experiences with nature and have called for a reimagining of human-nature relationships in Environmental Education (EE) that includes a response to the uneven inheritances and increasingly uncertain ecological futures that children of color experience [35,36]. Similarly, Rautio and colleagues point out that measuring children's connectedness to nature is not the only way of addressing their relationship with the environment [3]. At the same time, these scholars critique the dominant view of children in urban areas as nature-deprived or disconnected from nature for a lack of imagination and for portraying the majority of the world's young people as victims. They caution against a deficit framing that ignores the fact that youth in urban areas live in a complex coexistence with nature and the built environment and, in many cases, are part of grassroots efforts to redefine their relationship with natural systems and reclaim the narrative about their communities. So, what does education look like that addresses the intersecting issues of environmental and social justice, while not placing the sole onus of fixing unjust systems on the people who suffer the most in those systems?

The projects presented in this paper are examples of reimagining EE by focusing on the challenges of human interdependence with nature in the urban ecology and the agency and creativity of young people to address those challenges. We refer to the projects as place-based civic science to emphasize the focus on the local community and students' contributions to that community. Although the specific issues addressed may vary, in all projects, classes of students and their teachers work collaboratively with adults from local environmental organizations. Together they identify environmental problems in their local community, learn core content and gather relevant data, and take concrete action to mitigate the problems they identify. Learning about and connecting with nature happens primarily through the lens of human–nature interdependence; students are not simply enjoying nature apart from their urban space but are learning to appreciate its role in their everyday lives. Through that lens, students see the importance of personal and systemic behavior change as they gain an appreciation of human impact on nature and how their personal decisions, as well as the systems that support consumptive lifestyles, impact natural systems. However, individual acts of conservation are not the main form of environmental understandings and commitments that flow from these projects. Insofar as collective action—working together to contribute something concrete to improve local environmental conditions—is at the heart of projects, students gain awareness of their capacities to work together to preserve, sustain, and improve the conditions for nature and

for people in their urban community. Their environmental identities are forged as they develop a sense of connection to and an awareness of their interdependence with other living things and their responsibilities for the larger whole of the environmental commons.

2. Methods

All projects take place in southeastern Michigan, where over half of the state's population resides, and are part of the Southeast Michigan Stewardship Coalition (SEMIS), a regional coalition focused on place-based stewardship education (PBSE) that recruits teachers and adult community partners to engage students in learning about and acting to mitigate local environmental problems. Data are drawn from our studies conducted from 2014–2019 in which we have been documenting what students learn through their participation in what we refer to as place-based civic science projects.

In this paper, we report on results from student responses to written reflections and on focus group data for a subset of these students: student participants who attended schools in two urban metropolitan areas. The school districts in these two urban cities primarily serve African American and Latinx students from low-income and working-class families, and 76% and 86% of the student populations in the districts are eligible for free and reduced-cost lunch (N.B.: In the United States, students are eligible for a free or reduced-cost lunch at school if their family's income falls below a particular threshold).

Written reflections were collected from 450 6th–12th graders (approximately ages 12–18), the majority of whom (76%) were high school students (9th–12th grade). Based on student self-reports, 57% identified as Black, 17% Latinx, 8% White, 1% Asian, 14% mixed race/ethnicity, and 3% other. Fifty-two percent of our participants identified as female, 46% identified as male, 1% identified with another gender identity and the rest chose not to answer. Focus group data were collected from 17 high school students: 82% were African American, 12% White, and 6% Latinx; 53% female and 47% male.

Although the content of student projects differed, all focused on the intersection of the natural and built environment and the connections between environmental and human health and safety. Projects discussed in this paper include students' reclaiming abandoned housing and converting it to public park spaces, applying green infrastructure solutions to reduce stormwater runoff, ecosystem services and tree plantings on their school campus, addressing food injustice and sustainable farming practices through community gardens, and air quality and pollution from nearby industry and the impacts on human health.

The study was completed as an evaluation in collaboration with the SEMIS Coalition, who has permission to conduct programming and evaluation in the schools. The study was reviewed by the University of Wisconsin Education and Social/Behavioral Science Institutional Review Board and the IRB determined that the project is evaluation and does not constitute research as defined in 45 CFR 46.102(d). While parental consent was not required, we have followed ethical considerations in informing participants of the study, obtaining verbal assent, and maintaining the confidentiality of participants.

Measures and Analysis

Reflective essays were collected, and focus groups conducted after students had completed their projects (typically several weeks before the end of the school year, approximately late May). Students from 18 classes (N = 450) completed reflective essays responding to one of the following prompts: "Was there anything you learned in the project that you could use to help your community (or people in your community)?; What did you learn about your community, other people or species in your community or the environment from the work you did? What did you learn about what kids can do to solve environmental problems in their communities?" Three focus groups were conducted in two schools (one in each of the two communities outlined above), following a semi-structured protocol with prompts such as: "Tell us about your experience working on this issue with your classmates and community members; What were some of the different contributions

of your classmates?; Tell us about working with community members on this project; Why do you think your work was important?"

Thematic analyses of student reflections and focus group responses were conducted with a semantic approach and both deductive and inductive methods for several data sets during the study period. Prior to coding students' reflections, each of the paper's authors read a random set of students' responses and developed a list of emergent themes. An inductive approach was used in reviewing student responses that generated an initial list of emerging substantive categories (catalogued by two of the papers' authors and graduate student assistants), including those relevant to this special issue: connection to and respect for nature, culturally- and community-based environmental agency, understanding of interdependence and human impact, and the intersections of environmental and social justice. Within these categories, the study team, using a deductive approach, looked for topics central to environmental identity, belief, agency and pro-environmental personal practice and action behaviors [37] and assigned responses to those categories. The coding process also was informed by the authors' observations of students' engagement in projects and how they experienced the natural environment within their urban context.

3. Results

3.1. Environmental Identity

Students' responses indicate that learning about the environment was an important step in connecting with it, leading to care and respect for the natural world, with many students expressing an environmental identity or sensitivity in their affinity for nature. Students, such as the following, wrote that learning about the unique habitats and needs of different species made them appreciate the environment more: "That rain gardens and stuff like that can't just be made anywhere. They have to be made in certain places where [it's] well habitated [sic]. I learned a lot of new plants. I used to think that plants just grew when you plant them and put water and then the sun, but its more to it than that, each plant grows at a [different] time, like a bloom time and all that stuff and require a certain amount of sun and stuff like that, I learned that" (18-year-old, 12th grade, Latino male).

Others specifically used language referring to their new-found sense of connection as part of life on Earth: "I felt it was important to do this because it helps us learn about our eco-system, and feel connected with our Earth" (14-year-old, 8th grade, White female). In many responses, students alluded to the fact that positive feelings they gained from the sense of connection to nature came about because of these projects, such as the student who mentioned that he used to think "that nature is dumb it didn't matter to me at all because it wasn't connected to me" but now knows "you shouldn't mess nature up . . . I learned this by going to the park looking around getting the opportunity to know about nature in my community in how [it's] connected to my ecosystem and how I should not mess it up" (15-year-old, 9th grade, Black male).

Consistent with the research on how time spent in nature nurtures an environmental identity, many students noted that the affinity for the environment that they gained through projects was a result of the time they spent in nature, such as the student who noted that the project was important because, " . . . in order to understand your environment fully you need to work outside and know how nature works. By understanding nature we can solve problems and search for more sustainable ways of living" (14-year-old, 8th grade, White male). It bears repeating that these projects did not take place in bucolic natural areas but in the urban settings where these students lived and were able to observe the nature around them.

In their reflections, many referred to loving and treasuring nature and, because of this affective relationship, the importance of taking care of it. This indicates an emotional attachment to natural spaces and living beings that many had not experienced or felt as deeply before engaging in these projects. Some students referred specifically to changes in themselves and their relationships to the natural world that they attributed to their involvement in these programs:

a. "It had [sic] changed me so much I [started] to like plants and learned new stuff about the plants, it showed me how to love plants . . . plants are good to learn about it [sic] they are interesting species" (14-year-old, 8th grade, Asian female).

b. "[It] made me appreciate plant life more. Learning about how plants grow, eat, and live in general, has boosted my appreciation for plants. Learning how plants provide for us and caring for them does great wonders" (15-year-old, 9th grade, Black male).

For others, such as the following student, the projects reinforced what was already a strong passion, signifying an environmental identity: "I'm really passionate about air quality . . . I wrote an essay and I wrote so many things about air quality, so it's a thing I'm really passionate about cause we have to save our mother earth, basically . . . If more people know about it, more people will try to change it . . . if we don't change it, well, bad things are gonna happen, our air quality is gonna get worse, and soon enough people are gonna start to get sick and die because of our air quality" (13-year-old, 7th grade, Black female).

3.2. Interdependence of Fates and Human Impact

As noted, the place-based focus of these projects means that, rather than a respite from urban life, nature is experienced as integral to the urban ecology. It is not surprising, then, that many students discussed their sense of connection to nature by referencing the reciprocal relationships and interdependencies of humans with nature and natural systems as well as the impact of humans on those systems. For example, one student recounted, "The work we did in our school's garden made me connect with nature and showed how I can help nature while benefitting from it myself. I learned how local grown food can help the community prosper and that it takes team effort to run such a big garden" (15-year-old, 10th grade, Black male).

Students also realized how we bear responsibilities because of the reciprocal relationships with nature, with one student commenting that she learned that "Biomimicry surrounds our everyday life and how all organisms use each other for beneficial purposes. I now understand a lot more about how the land works. How rain is collected naturally and how nurturing trees helps creatures and plants. How each contributor in our ecosystem shares multiple responsibilities, including humans" (17-year-old, 11th grade, Black female). Many students referenced an understanding of the interdependence of all species and Earth's natural systems, as indicated in the following quotes:

a. "We need animals to survive. Animals need us to survive. They need plants and things and stuff to survive" (16-year-old, 10th grade, Black male).

b. "Clean water is important to our world because if we don't have it we will not be able to live or eat because animals need water [too] so we have to clean our water so we can live" (15-year-old, 10th grade, Black female).

Students' awareness of human/nature interdependence included the idea that working with nature, instead of against it, could have benefits for many living things: " . . . in some of the projects I learned that if you work with nature you can have a better outcome when [it's] a flood. For an example our soccer field flooded because it was built on a down slope so it had water left over after it rained. We used green infrastructure to fix it. We are using [permeable] pavement" (15-year-old 9th grade Black female).

Many responses indicated an understanding of the impacts humans have on the environment and what students themselves can do to protect it: "Say, for instance, I drop a can on the ground or, no, like one of those plastic things that come on cans. I don't care about it so I don't throw it in the trash. A sea gull might like, oh my god, a seagull might get that on his neck or would choke or would try to swallow it, which I don't think they will but it's a possibility. So I think if you like, clean, like watch where our trash goes, it can, like make the world better so we don't have to harm our animals" (14-year-old, 9th grade, Black female).

An awareness of human impact on the natural environment and how environmental education could change the negative impacts was succinctly summarized by the following

student: "I think that one of the main reasons we have so many environmental issues today is that we are not aware of what we are affecting. By teaching students to be aware, we could change that" (17-year-old, 11th grade, Black female).

3.3. Human/Environmental Health

Students' increased awareness of human impact on the environment was often expressed via connections made between their personal conservation behavior and the quality of the natural environment on which the health of the community depended: "One way you can make our air quality better is to use reusable things to cut down on pollution to help stop air pollution so we won't have to worry about health risks as much" (13-year-old, 8th grade, Black female).

Many referenced larger interconnections between human health and environmental health, such as the student who noted, "I learned how air quality impacts people's health and the earth in general" (14-year-old, 8th grade, Black female). Others identified connections between environmental health and their community's well-being: "One thing I learned was that there are a lot of people who get sick because of the smell from the incinerator and it can cause trouble with breathing, cancer, birth problems, [and health risks]. So we need to be aware of these things happening to people in our community. We need to protect the people with asthma because it is a very difficult time if they breathe in the smell" (13-year-old, 7th grade, White female).

For some students, awareness of the connections between human and environmental health raised issues of environmental justice: "One of the things I learned was that there are many things around us that are polluting our air and slowly killing us, yet many people are blind about it and don't know a thing. This could help the community because they would open their eyes and be able to see what these things are doing to us and [possibly] stop them" (14-year-old, 8th grade, Latino male). An awareness of the disproportionate environmental burdens borne by their community was mentioned by some students and, notably, the burdens on humans and other living things were referenced: "Places outside of Michigan sent their trash to our incinerator... On rainy days, air quality gets worse. Zero waste cities exist. Air pollution can get so bad in some places that birds and other wildlife get diseases very easily" (13-year-old, 7th grade, White male). As noted in this quote, people, plants, and animals are all part of students' concepts of who is impacted by environmental degradation and who the members of their communities are.

3.4. Relevance of Their Urban Context

Students' references to learning about the impact of humans on the environment and people's reliance on nature for survival was often specific to their urban context, including understanding nature as part of the human built and engineered world, as seen in the following student's response: "We live in a [watershed]. When it floods rain gardens are good for floods and rain gardens filter water and the reasons we have floods is because half of the city is [covered] with [impervious] surfaces" (12-year-old, 6th grade, Latino male).

The deeper understanding and appreciation of nature was articulated by some students in the form of their explanations of how restorative practices can help reset the ecological balance in the urban built environment: "I've learned not only how rain gardens work, but what makes them important. Rain gardens help prevent/control flooding. The flowers/plants play a big part in the rain garden. The soil also contributes to the rain gardens. I learned that some pollution such as fertilizer from our yards increase the growth of the plants and some plants absorb certain [nutrients]. I've learned the placement of rain gardens are important, and they aren't there to just look pretty. I've most importantly learned rain gardens are need[ed] in communities like mine" (17-year-old, 11th grade, Black female).

In this urban context, students' responses often included the specific benefits to humans from protecting nature, i.e., as a means of improving safety, for the benefit of human health, and as a natural resource for people. For many, these were personal

connections, and the fact that the projects they worked on addressed issues relevant to their communities, made their efforts more meaningful: "I learned that the water can get really dirty and not only because of humans. But also I learned that when humans mistreat the water it doesn't only affect water [wildlife] but also drinking water. I will let the community know about the issues about the river and the possible outcomes of it. This experience was different because I actually dealt with something that was going on in my community, and also got to go there myself" (15-year-old, 10th grade, Black female).

Similarly, students frequently referenced their own experiences with urban environmental issues: "I have standing water by my house. And before I learned about rain gardens I did not know what I was going to do about the problem but now I know. I can tell people about rain gardens to see if they want to build one" (15-year-old, 9th grade, Black male). Perhaps because of the action-oriented nature of projects, a majority of these responses also incorporated students' ideas about how to address such issues, as showcased in the following quotes about direct action solutions:

a.　"By my house there is a dead end and sometimes that street floods when it rains hard so to help we could put permeable pavements or rain gardens" (14-year-old, 9th grade, Black male).

b.　"I can help out people [where] I live because there is [puddles] everywere. But I leaned that I can break down concrete and replace it with something permeable" (14-year-old, 9th grade, Latino male).

c.　"I learned that people could have rain gardens in their yards. Rain gardens help control flooding. People are always saying that their backyards are flooded. So a rain garden could help stop flooding" (12-year-old, 6th grade, Black female).

These quotes allude to the efficacy of a local place-based approach as students identify environmental problems and know what they can do about them. After engaging in projects, they observe the environmental problems in their communities, or literally their back yards, with a new sense of empowerment and an awareness that they can do something to address the problem.

3.5. Pro-Environmental Behavior

In their reflections on human impact, students also noted the importance of individual behaviors in preventing cumulative damage to the ecosystem such as, "Don't throw trash down rain drains, cause that's basically going to plants and stuff like that, cause the water goes down the sewer, it might have animals and stuff in there, and throwing them down there, it could like hurt the environment" (17-year-old, 11th grade, Black female). For others, the cumulative impact of individual behaviors on the environmental legacy for future generations was noted, "I learned not to litter and how to use less water to save water and make the Earth a better place. Using less water can help a lot so we can have water for the next generation and after that" (12-year-old, 6th grade, Latino male). As this student's response indicates, personal conservation behaviors are learned, and young people in these projects are connecting their behavioral choices to sustainability and a healthy planet for future generations.

In response to how they can use what they learned in their community, some students referenced direct action, such as their learning and work in implementing green infrastructure solutions: "Curb cuts, these help with managing waste water and street water, and this would help the community because there isn't any water after this on the street," (15-year old, 9th grade, White male) capturing the reality of nature in the urban context.

For many, pro-environmental behavior via personal practice translated into influencing others, a form of environmental citizenship or action that could ripple through the community and expand the collective of concerned citizens: "I learned that the water in the [local river], it was very clean because of the [animals] in it that could live in it and prosper as a species. I learned about how humans affect the water while not even knowing. I will talk to more people about making sure our water is cleaner for drinking and using productively. In my community, I could set up a poster or presentation explaining what

I've learned. This experience ... has influenced me to do all I could to help our environment" (15-year-old, 10th grade, Black female). Many students made links to their civic contribution by referring to the direct impact of their efforts on the community, such as the student who responded, "Now, I can inform people of how bad our air is and why [it's] so bad. Maybe if more people know, we can all help out our earth and make it better (14-year-old, 8th grade, Latina female).

3.6. Expressions of Agency and Identification as an Environmental Leader

The emphasis on action and what young people can do to repair damage to the environment helped many students realize their potential role as civic leaders, as evidenced in the following student's statement: "Since I now know the sources of my environment's pollution, I can come up with better ways to help the environment. With this information I can organize my own [clean-up] day. I could also encourage others to use more ecofriendly items. I could even start myself by not using straws. This information will help me help my community" (14-year-old, 8th grade, Latina female).

As exemplified in the following student quote, learning about the importance of nature for human well-being led to changes in personal behavior, and because of the emphasis on action in these projects, translated into influencing people in positions of power: "I learned that one tree in a specific location can save a lot of $ and water while also helping wildlife and lowering pollution. I have been able to use it at home when trying to conserve water ... I presented to [school officials] and my group also talked to [the facilities] departments. We planted trees all over to help future generations" (16-year-old, 11th grade, Black female).

In addition to informing and influencing people in power, students also gained reputations as community environmental experts, the 'go to' person who can advise others and communicate results of their work: "Through this project, I learned about how trees grow, die, and what they give to our planet. I used what I learned by planting a tree on our school campus, thus, creating fresher, less polluted air. I applied what I learned to influence the grounds keepers at [school name] and presented a powerpoint on the benefits the tree would give. I would tell others about how they could use what they learned to make their community better by using you [knowledge], standing up for it, and teach others" (16-year-old, 11th grade, Latino male). Another student noted the influence they can have on their community at large, stating, "I could talk about air quality to my community to help them understand ways they could improve the air quality in our area and know what's causing the most pollution in our area" (14-year-old, 8th grade, Black female). As these quotes signify, students see the awareness and understanding gained in projects as an important first step in addressing environmental issues and see themselves as local experts with the ability to spread their understanding to others.

Some students made direct links between their knowledge of local environmental conditions and the role they could play in helping those most vulnerable, such as the following student commenting on their project monitoring local particulate pollution generated by a nearby waste incinerator: "When [it's] raining, has rained or when [it's] humid the PM is really high so it makes it harder for people with asthma. So I want to inform them of the dangers and when it is best for people with asthma to stay inside" (13-year-old, 8th grade, Latina female). As this response indicates, students are connecting human and environmental health, and acknowledging the civic contributions they are making via the direct impacts of their efforts on local residents' well-being.

For some students, an awareness of their newfound expertise extended to their capacity to lead others in developing a sense of responsibility toward our environmental commons: "I believe the work we are doing is important because not only are we helping the environment around us, we are teaching others to feel responsible for their environment too" (17-year-old, 12th grade, Black male). Another student referenced the importance of others seeing your behavior so that they might emulate you and change their behavior as well: "I should keep this up. I go home and started planting trees. Worked with my neighbors, they came out cause they found it interesting that I was doing it" (18-year-old,

12th grade, Black male). In this sense, students are developing identities as exemplars in their community, an inspiration to fellow residents.

Often a student's actions as an environmental leader took the form of guiding or nurturing future generations of environmentalists: "The environment is a wonderful thing that must be treasured and taking care of and not be abused. We should remind [ourselves] and future generations to not abuse this power and love the environment for all it does for us" (15-year-old, 9th grade, Black female).

The team effort or collective action emphasis of these projects came through in students' insights about the power of young people to effect change, as the student who reflected, "I learned that if people work together they can accomplish a lot. And how animals rely on many things to survive and if factories pollute rivers, lakes or any type of land, animals can die off, which can make other animals die off too. I learned that you don't have to be an adult to help with problems or solve them" (15-year-old, 9th grade, White female). This sense of collective agency also reflects a shift from individualized pro-environmental behavior toward a role as a community activist that is often not captured in the PEB framework. Another student pointed out how young people can be leaders for social-ecological change: "We make our community. Without us, there is no community. So we have to make our neighborhood safe for our further generation (clean water, etc.)" (14-year-old, 9th grade, Black female).

Others connected the political voice they were claiming to the skills they were learning as environmental activists: "We learned about how to write letters to the government. We could use this to help our community because we can change things we don't like" (13-year-old, 8th grade Black male). The sense of collective agency expressed in these reflections may be especially empowering for marginalized youth living in urban areas whose communities have been denigrated in media and whose voices have been largely absent from environmental decision-making.

Indeed, because their environmental work was public and could be seen by people in the community and because teachers and community partners encouraged them to share their insights with others, students gained a level of comfort in using their voice to address the environmental issues in their neighborhoods, reflecting an environmental action competency, such as the student who noted, "Something I learned that could use to help my community was that you shouldn't be scared to try to contact people that have power. If you contact them, something big could definitely happen" (12-year-old, 7th grade, Latina female).

3.7. Justice and Systemic Change

In these projects, students' local communities were a source from which they drew knowledge as well as one to which they contributed. Thus, the questions that drive students' investigations are drawn from the health and safety issues that affect their everyday lives and the lives of other members of their community. Students are encouraged to share and act on what they witness, which in an urban context, often involves drawing links to institutional polluters of the local environment, bringing issues of social justice to the fore, such as the student who noted, "I learned what the incinerator is and how harmful it is to the earth. The way it burns trash and the ash from it that gets into soil, farms, gardens, and crops. I learned that I can make a change in my community and it made me passionate about doing so. I fought for a change when I presented at the [regional] community forum and going really showed me that kids can make a change" (12-year-old, 6th grade, White female). Some students made direct connections between environmental injustices and the corporations that create this damage but face little in the way of consequences: "I learned how many of the major companies are contributing to the air pollution that is worsening the air quality. The companies are getting away with polluting since sometimes there's not enough evidence to link the pollution towards them. Even if they do get fined, the fines usually don't have a deadline or penalty if not paid. To sum it up, I learned that a

lot of companies are polluting without consequences and worsening the health of others" (14-year-old, 8th grade, Latino male).

In addition to the disproportionate burdens of environmental pollution borne by their communities, an awareness of environmental injustice was also revealed in some students' reflections about the disproportionate benefits that accrue to corporations that are depleting the natural resources that support life. Michigan's location in the center of the Great Lakes was the motivation for some projects to investigate where that water goes and some students learned about the Nestle corporation's bottling (and privatization) of this natural resource. Several summarized what they learned: "Nestle sells river water that is free and how much they are taking away from the river. It is affecting the people that live near that river because they are taking water away without thinking about others and the river," (13-year-old, 6th grade, Latina female) and another who related, "Learning nestle pays around $200 a day to take as much water [as] wanted from Michigan. It is important to inform more people because they are only paying $200 for possibly millions of gallons of water which is harming our environment" (12-year-old, 6th grade, Latina female). These insights about the environmental injustices baked into our system of resource use and distribution point to a very different pathway for developing an environmental identity from the individual conservation behaviors emphasized in PEB. Neither is wrong and both are necessary.

The emphases on local place and students' agency in these projects also figured in students' reflections on what they could do to address the unhealthy commercial systems of food production and distribution. The following student made such connections to their group's urban gardening work:

The work I did learning about community gardens was important to me because it shed new light on the importance of health in my community. I learned that many people in the [city name] community are very [dependent] on the commercial foods provided to us by supermarkets and grocery stores. I learned that depending on these sources can result in a less healthy non self-driven lifestyle, whereas growing an [independent] garden promotes self-sustainability and healthy eating. I learned kids like us can solve these problems by putting forth the effort to create our own gardens. Doing this has improved healthy living awareness and willingness to support one's self through garden work in my community environment (16-year-old, 11th grade, White male).

In urban communities, and especially for people of color, environmental issues are inherently social justice issues, and many students expressed their work at this intersection:

> Over the course of this project it has become abundantly clear that a community garden may be very important and beneficial. There is so much we don't know about the food we eat, and these could help prevent that. This is also majorly beneficial in places of lower income, so in our community those who can't afford to eat healthy would be greatly helped. Students participating in this opened our eyes to other things we could improve on in our daily lives to further help the environment from food, to transportation, and at home energy consumption. Hopefully our work in the garden will help our community and open their eyes to their own food energy consumption so that we as a community can improve for the environment and our own health. (17-year-old, 11th grade, Black male)

4. Discussion

As pointed out in the call for this Special Issue, environmental psychology is hindered by a lack of cultural consideration [1], with limited studies focusing on young people from racial/ethnic minoritized populations and disadvantaged communities, even within WEIRD societies. The key findings from our study support widening the lens of what constitutes an environmental identity and pro-environmental behavior. Student responses pointed to identities emphasizing connections between social and environmental justice and the links between the health of people and the health of the environment. Such identifications with the natural environment complement foundational studies on environmental

identity that focused on an individual's sense of connection or emotional attachment to some part of the natural world. In addition, our results highlight how young people from non-WEIRD communities in the U.S. display and understand pro-environmental behavior not just as individual conservation behaviors, but rather as collective direct and civic action behaviors to preserve and improve urban environmental and community conditions.

Place-based civic science, as practiced in these projects, provides a model for students to learn about environmental issues of public consequence, while working with others to do something about them. Results presented in this paper suggest that focusing on local environmental issues can cultivate students' appreciation and affinity for the natural world. Analyses of student reflections on their experiences indicate an increase in understanding and appreciating the interdependence of humans and other living things that depend on the natural systems that sustain life in their local place. Students' responses revealed that they are building an environmental identity through the connections and affinity to nature as they observe it in the urban ecology and realize the linked fates of humans and other species to local environmental conditions.

Analyses also revealed that students are developing environmental identities in ways not traditionally measured. By engaging in civic science, applying their environmental science learning to actions that improve conditions in their community, young people are also identifying as contributing members of their communities. Rather than something "over there" to be preserved and protected from human intrusion, nature is understood as an integral and dynamic part of their community that is impacted by the personal and collective behaviors of humans as well as the systems that humans have put in place.

The focus on local place in these projects enables young people to identify with and feel that they belong to the local environmental community, which motivates feelings of social responsibility for and civic action on its behalf [37]. Analyses revealed that students appreciate that human choices impact the ecological and human communities in their local place. Student responses were brimming with examples that indicated that they view themselves as capable of taking charge in order to repair environmental harms—by educating and mobilizing fellow residents and younger generations, by making recommendations for change to people in power, and by speaking out against the environmental injustices they have learned about.

Linking learning to the actions young people can take, both individually and collectively, cultivates students' identities as environmental citizens and activists. Though they might not identify with the terms environmental citizen and activist, in their responses, students expressed multiple ways in which they could apply their skills and knowledge to contribute to their communities' environmental and social well-being. They referenced the direct impact of their efforts on their local environment and community, such as decreases in flooding and pollution, and made connections between their work and the health and well-being of their community and its members. Research has shown that people who engage in environmental actions often have a strong environmental identity [14,31]. Analyses of student reflections on their experiences suggests that the inverse may also be true, that is, that engagement in environmental action, itself an act of care, can strengthen students' environmental identities and increase awareness of the role the environment plays in their everyday lives. Rarely do young people, especially those in marginalized communities, have opportunities to collectively address the environmental issues their communities face. As our results show, such opportunities can be crucial conduits whereby youth come to see themselves as community environmental activists.

Alisat and Reimer observe that people participate in environmental action along a continuum [31], and Jensen and Schnack propose that action is based on people's level of 'action competence', i.e., their willingness and ability (skills and knowledge) to participate in behaviors, activities, and actions [38]. Our results echo their points, in that young people may start with the modification of their own behavior, which leads to influencing the behaviors of others, such as the students who referenced influencing their friends, families, and neighbors. For many, learning about the importance of nature for human well-being

led to changes in personal behavior, and because of the emphasis on action in these projects, translated into influencing people in positions of power.

Analyses also revealed that other students may be farther along the continuum, participating in such things as civic environmental action [31,38]. In such cases, students expressed their environmental identity as community leaders, the 'go to' person who can advise others and communicate results of their work to fellow community members and to people in positions of power. Finally, even further along the continuum, some student responses pointed to environmental leader identities where they imagined themselves taking on active roles in educating and organizing efforts to mitigate environmental issues, advocating for the health and safety of their communities and influencing policy and practice related to root systemic causes of environmental problems.

Place-based civic science programming focuses on fostering environmental actions, participatory activities and action competence and differs from programming that focuses primarily on changing personal awareness and behavior. The sense of agency and efficacy that came through in students' responses suggests that through these projects they felt empowered to act in ways that are relevant to their communities. Their responses were replete with concrete examples of how they could prevent or mitigate environmental problems, speak up to take a stand or apply their learning to future collective action efforts. Such beliefs in one's competence and capacity to act are critical for nurturing long-term engagement in environmental action [30].

The place-based civic science approach of these projects frames environmental issues as social justice issues, emphasizing the intimate links between health, well-being, and relationships in a local area and stewardship of the commons that people in that area share. This social justice framing emphasizes not only the environmental impacts of human choices but also the disproportionate environmental burdens borne by communities that have been marginalized by those in power. As voiced in students' reflections, they see these connections, articulating how their learning is useful in the real world and the context of their communities' diverse needs. As student responses in this paper indicate, when youth from racial/ethnic minoritized backgrounds engage in environmental action, they are often motivated by an awareness of the intersections of class and racial/ethnic inequities in environmental and human health [34]. Indeed, it is young people who are at the forefront of intersectional environmentalism, asserting that their generation brings a new viewpoint to what the environment is and who can be an environmentalist [39]. Although students in our study did not use this term, they do exemplify a new type of environmentalist: one who engages in stewardship as well as education, communication, and advocacy for the environmental common good.

5. Conclusions

Our study expands the notion of the natural environment as a commons and the groups who would and do care about it. Whereas a "wilderness" mindset has historically been the focus of environmental education, this study shows that the attention and commitments of youth in urban areas are nurtured through this model of place-based civic science education. The environmental identities of the students in these projects were forged as young people saw the links between the health of their community and that of the local natural environment, and what they could do together to address local environmental harm.

Further research is needed into young people's identity as intersectional environmentalists, which could expand the notion of and pathways to the formation of an environmental identity, particularly in non-WEIRD communities. In addition, quantitative studies on the efficacy of place-based civic science for fostering the collective and action-oriented sustainability behavior of youth from racial/ethnic minoritized backgrounds in urban low-income communities is needed.

Insofar as environmental education has not been a core part of curricula in public schools, students in better-resourced schools have typically participated in such "enrich-

ment" programs. In contrast, our study focuses on young people of color from low-income backgrounds and thus expands the scholarship on the ways in which an environmental identity and environmental commitments are formed. Based on the reflections of the young people in these projects, we conclude that goals of increasing environmental awareness and fostering environmental behaviors can be realized if they are contextually grounded and have space for addressing the environmental threats and underlying environmental injustice that are facts of life in low-income communities.

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