
EMPIRICAL RESEARCH

Development of Ecological Place Meaning in New York City

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Urban environmental education helps students to recognize ecological features and practices of cities. To understand the value and practice of developing such ecological place meaning, we conducted narrative research with educators and students in urban environmental education programs in the Bronx, New York City. Narratives showed that educators are cultivating ecological place meaning to help students appreciate ecological aspects of cities, and develop their imagination of how their environment could be improved. Such ecological place meaning is nurtured through direct experiences with the urban environment, social interactions within educational programs and communities, and development of students' ecological identity.

Keywords *ecological identity, ecological place meaning, narratives, New York City, sense of place, urban environmental education*

INTRODUCTION

Cities are the primary places where many urban residents experience nature-related features and activities. For example, city dwellers walk in parks, gather in community gardens, steward green infrastructure, experience natural disasters, observe wildlife, and enjoy street trees. On the one hand, cities are often perceived as “places of culture and society” as opposed to natural landscapes

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(Cresswell, 1999), as concrete jungles (Glaeser, 2011), or places where the built environment, not nature, dominates attention (Barlett, 2005). Some people even view cities as the antithesis of natural areas (Beatley, 2000; Martino, 2009), or assume that in general the environment “is found somewhere far from the city” (Pickett, Buckley, Kaushal, & Williams, 2011, p. 334). On the other hand, scholars advocate for viewing cities as natural phenomena, or places containing nature. For example, Lynch (1971, p. 12) argues that “Man is himself a part of nature, and his cities are as natural as his fields;” Spirn (1984) considers cities as part of nature; and Cronon (1996) regards cities as one type on a continuum of natural landscapes. Similarly, Beatley (2000, 2011, 2014) calls for viewing cities as already or potentially green and sustainable; suggests that the ideas of wilderness and nature can be extended to street trees, rooftops, and hydrological features in addition to established public parks or other green areas and ecological processes; and proposes that, “We must begin to move into a deeper, more profound understanding of cities as nature, as wondrous and significant and valuable as those in the most pristine national parks” (Beatley, 2011, p. 152).

We consider such natural or environmental dimension of our perception of cities and other places as ecological place meaning. A commonly used definition of the broader term *sense of place* describes human perception of places in general, which includes place attachment and place meaning (Farnum, Hall, & Kruger, 2005; Semken & Brandt, 2010; Smaldone, Harris, & Sanyal, 2005; Stedman, 2000, 2002, 2003b; Van Patten & Williams, 2008). Whereas *place attachment* refers to emotional bonds between people and places, or how strongly a person is attached to a place (Davenport & Anderson, 2005; Jorgensen & Stedman, 2001; Lewicka, 2011; Low & Altman, 1992), *place meaning* is the symbolic meaning that people ascribe to a place (Smaldone, Harris, & Sanyal, 2008; Stedman, 2002, 2008). Place meanings “characterize ways in which an environment may be valued” (W. Stewart, 2008, p. 84), and may reflect “the layers of associations that we attach to places” (Lew, 2006, p. 30). Resonating with Thomashow’s (2002, p. 76) idea that “Exploring sense of place involves thinking about home and community, ecology and history, landscape and ecosystem,” place meanings may include ecological, cultural, aesthetic, architectural, familial, political, and economic meanings (Ardoin, 2006; Ardoin, Schuh, & Gould, 2012; Manzo, 2005; Semken & Butler Freeman, 2008; Young, 1999); human and natural history (Williams, 2008); personal meanings attached to a place (Lynch, 1971); and meanings associated with activities such as boating or birding (Spartz & Shaw, 2011). In this study, we focus specifically on *ecological place meaning*, which we define as the extent to which ecosystem-related phenomena are viewed as valued or important characteristics of places; these phenomena may include natural habitats and objects, green infrastructure, and related activities such as environmental stewardship and outdoor recreation (Kudryavtsev, Krasny, & Stedman, 2012; Kudryavtsev, Stedman, & Krasny, 2012).

The sense of place literature describes factors influencing place meanings, and how place meanings may impact human interaction with the environment. Place meanings are influenced by features of the biophysical environment (Stedman, 2003a), pivotal moments or other significant life experiences that happened in a place (Manzo, 2005), and physical changes in landscapes (Johnson & Zipperer, 2007); traveling outside of a place may help people find greater value in its meanings (Davenport & Anderson, 2005; Smaldone et al., 2008) perhaps by increasing place repertoire and cross-place friendships (Fisman, 2007). Place meanings can be informed, mediated or created through social channels, such as interpretative materials, mass media, literature, television, films, photography, customs, discussions, storytelling, and other social interactions (Cresswell, 2011; Malpas, 2010; Sanger, 1997; E. J. Stewart, Hayward, & Devlin,

1998; Stokowski, 2002; Vanclay, 2008). Different people may ascribe different meanings to the same place (Stedman, 2006), possibly related to their personal identities (Fisman, 2007); these findings are consistent with the literature suggesting that identities may focus one's attention on certain features of the context or the environment, and not others (Oyserman, Elmore, & Smith, 2012).

Although scholars do not define "ecological place meaning" per se, they point out that viewing nature as a valued component of a place—often in combination with strong place attachment or place attachment based on nature-related place meanings—may influence pro-environmental behavior or decision making related to natural resources (Andersson, Barthel, & Ahrné, 2007; Brehm, Eisenhauer, & Krannich, 2006; Brehm, Eisenhauer, & Stedman, 2013; Henwood & Pidgeon, 2001; Scannell & Gifford, 2010). Researchers also contend that people tend to protect places (Manzo & Perkins, 2006) or aspects of places (Stedman, 2003b) that are meaningful to them, which implies that strong ecological place meanings may encourage people to protect nature-related elements of those places. Interestingly, relatively few empirical studies on sense of place—let alone on ecological place meaning or similar constructs—have been done in cities despite a growing conversation about ecological features and practices in cities. Further, scholars argue that any shared meanings that are part of human culture and assigned to places can regulate social practices (Massey & Jess, 2000), which may have implications for how people manage places. For example, one could hypothesize that if people attribute ecological meanings to urban places, they will be likely to use green spaces or promote green urbanism and other environmental practices in cities.

Thus the question of adding the layer of ecological place meaning to the urban cultural landscape is interesting from the practical standpoint to promote pro-environmental behavior, and from the theoretical standpoint to advance our understanding of place meanings. Further, understanding how ecological place meanings develop in cities is important given environmental education's growing focus on local environments (Gruenewald, 2003; Semken & Brandt, 2010; G. A. Smith, 2002; Sobel, 2005) including in cities (Kudryavtsev, 2013), and that urban environmental education programs have been shown to significantly strengthen ecological place meaning among urban participants (Kudryavtsev, Krasny, & Stedman, 2012). Yet despite notable progress in sense of place research—and despite environmental education's growing focus on local and urban environments—we know little about *why* and *how* urban environmental education programs develop ecological place meaning among urban students. Thus, in this research we ask: (a) Why do urban environmental educators nurture ecological place meaning among urban students?; and (b) How do urban environmental education programs nurture ecological place meaning?

METHODS

Narrative Research

We used narrative research to answer the research questions. Use of this method is consistent with the exploratory nature of this study and its potential to contribute to theory, and with our goal to elicit participants' deep reflections on their experiences and the meanings they attribute to their environmental education practice. Narrative research is the study of experience as story (Connelly & Clandinin, 2006; Pinnegar & Daynes, 2007), the study of stories (Polkinghorne, 2007), the study

of experience as it is lived (Clandinin & Rosiek, 2007), or the study of descriptions of a series of events (Pinnegar & Daynes, 2007). Narratives are coherent personal stories co-constructed by an interviewee and interviewer, and reflect the respondent's experiences and views related to research questions (Emerson & Frosh, 2004). In narrative research, "the interview is not just a means for collecting data, but itself a site for the production of data" (Elliott, 2005, p. 17). Unlike chronicles that simply list events, narratives are viewed as a way of organizing and communicating human experiences (Hart, 2002), and are characterized by "a meaning structure that organizes events and human actions into a whole" (Polkinghorne, 1988, p. 18). In contrast to positivist research that mirrors pre-existing entities, narratives construct subjective reality (Spector-Mersel, 2010) and meanings (Berger & Quinney, 2005), and uncover "the values and motivations that lie behind people's actions and decision making" (Elliott, 2005, p. 176). In addition, instead of focusing on causal relationships, narrative research uses the interpretive framework to "help researchers to explore the mechanisms underlying the causal relationship: the how and the why behind the what" (Dodge, Ospina, & Foldy, 2005, p. 289; Lin, 1998). Narrative analysis can produce meaningful findings in the form of discoveries, theory-making and generating hypotheses (Lieblich, Tival-Mashiach, & Zilber, 1998; Wells, 2011), which echoes the goals of our research. In sum, narratives can help us uncover the value of ecological place meaning, and articulate how this meaning is being nurtured.

Research Site and Participants

This research was conducted with nine educators and five students in six community-based organizations and one high school in the Bronx River watershed in the Bronx, New York City (Table 1). As we prepared for this research, these programs were recommended to us by three environmental education professionals (Mary Leou, New York University; Gretchen Ferenz, Cornell University Cooperative Extension-NYC, and Jill Weiss, Environmental Education Advisory Council) as representative of environmental education in the city. These urban environmental education programs involve students, approximately 14–18 years old, in learning about the urban environment during six weeks in summer; some of these programs also include after-school activities during 12 weeks in spring and fall. Some students participate in these programs for several years. Educational activities in these programs vary, but in general include: environmental restoration such as restoring oyster reefs, urban forests, or riparian habitats; maintaining community gardens, urban farms, green roofs, parks, flower beds, or street trees; environmental monitoring such as water quality testing in the Bronx River or bird surveys; environmental recreation such as boating or canoeing on the Bronx River; and learning indoors about the urban environment from educators, other professionals and community members. Sometimes students also participate in environmental activism through events in parks, community art and media, presentations, parades, distributing flyers, or writing letters. Although most educational activities take place in the Bronx, sometimes students explore other places in New York City such as Governors Island, Jamaica Bay Wildlife Refuge, the High Line park in Manhattan, or water treatment plants and rooftop farms. Occasionally educators take students to explore places outside the city such as rivers or farms.

In all seven identified program urban environmental education programs in the Bronx River watershed, we wanted to interview experienced educators and students who could share rich information about their programs and experiences. In 2010–2011, the first author conducted interviews

TABLE 1
Narrative Research Participants

<i>Interviewee</i>	<i>Position and organization in the Bronx at the time of interviews</i>
Educators	
Adam Green, 37	Founder and Executive Director, Rocking the Boat
Adam Liebowitz, 30	Director of Community Development and the A.C.T.I.O.N. program, THE POINT Community Development Corporation (CDC)
Anthony Archino, 31	Boatbuilding Program Director, Rocking the Boat
Carol Kennedy, 53	Science Teacher, Satellite Academy High School
Chrissy Word, 42	Director of Public Programs, Rocking the Boat
Damian Griffin, 43	Education Director, Bronx River Alliance
Jennifer Beaugrand, 32	Horticulture Program Director, Mosholu Preservation Corporation
Jennifer Plewka, 34	Director of Environmental Education, Phipps CDC
Julien Terrell, 28	Director of Organizing, Youth Ministries for Peace and Justice
Students	
Andre Rivera, 17	Former participant and current Youth Organizer, Youth Ministries for Peace and Justice
Celina Medina, 19	Former participant and current Program Assistant, Rocking the Boat
Elizabeth Severino, 19	Former participant and current Program Assistant, Rocking the Boat
Nia Terrelonge, 20	Former participant at Rocking the Boat; and current Program Assistant at Mosholu Preservation Corporation
Victor Davila, 16	Current participant in the A.C.T.I.O.N. program, THE POINT CDC

with nine educators, at least one educator from all seven programs who were willing to share their insights. These interviewed educators either had created their own programs or significantly adapted existing programs to fit the needs of their students. These educators recommended to us five former or current students for interviews. Students were selected by educators based on students' long-term involvement in these programs (at least two years), which would allow them to provide thoughtful, reflective answers in interviews.

Interviews

While narrative research encompasses autobiography, life stories, narrative ethnography (Lodico, Spaulding, & Voegtler, 2010) and personal narratives (Leon, Sandal, & Larsen, 2011), we used the narrative genre called "practitioner profiles" (Forester & Peters, 2005; Peters, Alter, & Schwartzbach, 2008). Practitioner profiles are edited transcripts of interviews (Peters, 2010) that have been used to generate first-person accounts of what people "do, feel, and experience in specific examples of their work" (Peters & Hittleman, 2003, p. 3) including, in our case, engagement in education programs. Narratives often have a beginning-middle-end structure (Berger & Quinney, 2005; Polkinghorne, 2005), with the main practice-related plot in the middle. To construct narratives, the first author conducted open-ended interviews with each interviewee in one to three sessions, lasting 2–4 hours total. Most interviews took place in summer 2010, except for one interview in 2011. Interviewees recounted their experiences as educators or students in urban environmental education programs. Three types of questions guided the interviews: (a) *background*: Where are you from, what were the key influences in your life related to your current position as an environmental educator or student, and how did you join an environmental

education program in the Bronx?; (b) *practice*: Tell me about particular projects in your education program that you conducted as an educator, or participated in as a student; and (c) *reflection*: What lessons from these experiences would you like to share, especially related to teaching or learning about the city as an ecologically important place? Each interview produced a mix of stories, as well as descriptions, opinions, and reflections.

The first author recorded, transcribed, and edited the interviews to create narratives, by which we mean the final version of edited interview transcripts. The final versions of narratives used in this study are not confidential, and participants and their parents allowed using their real names. We are aware of the constructivist and discursive aspects of narrative research (White & Drew, 2011), i.e., that much of meaning is constructed and analyzed during interviews when respondents decide to include, exclude, or emphasize certain events (Feldman, Sköldbberg, Brown, & Horner, 2004), or when the interviewer asks respondents to clarify certain ideas. Indeed, interviews influence participants (Childress, 2000), which may alter how interviewees see and reflect on their practice. At the same time, we agree that in interviews meanings are not formulated absolutely anew because they reflect “relatively enduring local conditions, such as the research topics of the interviewer, biographical particulars, and local ways of orienting to those topics” (Holstein & Gubrium, 1995, p. 16). In the process of constructing narratives, we were guided by the idea that good narratives “approach the complexities and contradictions of real life” (Flyvbjerg, 2004). To edit narratives, the first author put events into chronological order, shortened some episodes, and “erased the co-construction process” (Riessman, 2008, p. 58) by deleting interviewer’s questions and transforming messy spoken language and conversational exchange into a readable text. We used narrator check (Mears, 2009) to allow interviewees to amend their narratives, and confirm that the intended meaning in narratives is accurate and complete. Final narratives are between 4000–12,000 words. To judge the quality of the primary data, readers can access full-text narratives in the dissertation appendix available online (Kudryavtsev, 2013); see <http://dx.doi.org/1813/34149>.

Analysis and Interpretation

In general, qualitative analysis pulls together themes or patterns from the text, whereas interpretation draws meanings from the analyzed data and explores these meanings in a larger context (Ely, Vinz, Anzul, & Downing, 1997). We used “thematic analysis” as an approach to analyze narratives (Riessman, 2008, pp. 53–76), which is similar to “content analysis” (Lieblich et al., 1998, p. 112; C. P. Smith, 2000) or “holistic content analysis” that focuses on themes or patterns (Wells, 2011, pp. 44–49). Following Lieblich et al. (1998, p. 113), the first author repeatedly read narratives “as openly as possible” to find emerging themes related to sense of place in general. This type of thematic analysis with open coding has been used in other studies on sense of place using narratives (e.g., Rogan, O’Connor, & Horwitz, 2005) or semi-structured interviews (Manzo, 2005). The first author assigned temporary themes to highlighted meaningful segments, and repeatedly revised these themes until starting to see larger patterns among them, i.e., any patterns that could be relevant to the value of and fostering ecological place meaning. For example, a broad theme that we call “experiences of places” covered meaningful segments about experiences of urban nature, participation in hands-on environmental activities, and visiting distant places. Because meaning derives from interpretation rather than analysis (Hart, 2002), our next step was to interpret the broad themes and underlying excerpts in ways that enrich, support or challenge existing ideas

about the development of ecological place meaning in cities. As suggested by Lawler (2002) and Ospina and Dodge (2005), in our interpretation of narrative themes we focused on significance or meanings of underlying events, not just what happened.

Validity

We refer to validity as “the correctness or credibility of a description, conclusion, explanation, interpretation, or other sort of account” (Maxwell, 2012, p. 122), or “the believability of a statement or knowledge claim” supported by the evidence and argument (Polkinghorne, 2007, p. 474). In narrative research, knowledge claims are about the meaning that people ascribe to their experiences (Polkinghorne, 2007), or about a person’s understanding of reality (Dodge et al., 2005), not about causal relationships or replicable results (Lieblich et al., 1998). Validity of narrative research is often framed in terms of trustworthiness (Wells, 2011), or the credibility and plausibility of argumentation (Dodge et al., 2005). In this research, we use the following criteria for validity: persuasiveness, correspondence, and pragmatic use. *Persuasiveness* refers to plausibility of results or theoretical claims, as well as reasonable and convincing interpretation of narratives (Riessman, 1993). Persuasive arguments “lead readers through a progression of evidence (quotations from the collected text) and explanations of why other interpretations (which may have been tried during the research process) are not as adequate as the presented interpretative claim” (Polkinghorne, 2007, p. 477). We offer narrative excerpts to support claims, and discuss alternative interpretations where appropriate. *Correspondence* is testing conclusions with people whose narratives are analyzed (Riessman, 1993), and is similar to credibility, which reflects whether the researcher’s interpretation of the data “captures the true meaning of the participants’ experiences” (Lodico et al., 2010, p. 170). To address correspondence, first, we asked interviewees to revise edited interview transcripts to make sure that they adequately reflected their voice. Second, we shared an early version of this article with participants and they helped us revise our interpretation of their narratives. *Pragmatic use* is the degree to which narrative research “become[s] a basis for others’ work” and contributes to the development of knowledge (Riessman, 2008, p. 193). This aspect of validity reflects the idea that narrative and other forms of qualitative research are pivotal for major developments in knowledge because they are built on nuanced, complex, and sometimes conflicting stories that may extend existing theory (Flyvbjerg, 2004; Riessman, 2008). At the same time, Elliott (2005, p. 26) suggests that “the reader is left to make up his or her own mind as to how far the evidence collected in a specific [narrative] study can be transferred to offer information about the same topic in similar settings.” Because “human interpretation is always only partial” (Seamon, 2000, p. 170), narrative researchers usually do not claim that they offer “the only way to interpret a narrative” (Feldman et al., 2004) and invite readers to participate in the interpretation. Our work will pass the test of pragmatic use if our interpretations and conclusions are reasonable and useful to other researchers or educators.

FINDINGS

Interviewed educators have overlapping and consistent perspectives on the reasons for and approaches to nurturing ecological place meaning among students in urban environmental education

programs, and students' narratives supported the conclusions we drew from educators' narratives. First, the narrative analysis shows that all nine educators are trying to cultivate ecological place meaning among students to help students understand, appreciate, interact with, and benefit from nature-related aspects of urban places, and to develop among students a sense of possibilities and imagination of what their urban places, environment or ecosystems could be, and what steps can be done to improve these places. Second, all narratives from nine educators and five students reveal three general approaches to nurturing ecological place meaning among students in urban environmental education programs: (a) direct experiences of urban places, green infrastructure, and urban nature; (b) social interactions among students, educators, and environmentalists; and (c) development of students' identity, including ecological identity.

Complete narratives from nine educators and five students, from which the results and discussion are drawn, are available online (<http://dx.doi.org/1813/34149>). But given the space constraints of a journal article, below we offer selected excerpts and analysis of only two out of 14 narratives. These excerpts and analysis offer insight into how the general narrative themes emerged and addressed our research questions. The two narratives discussed here are chosen because they are representative and well-articulated, cover educator and student perspectives, and describe school-based and community-based environmental education programs. From these two full-text narratives, we selected excerpts that make two coherent stories illustrating common themes observed in most narratives.

An Example Educators' Narratives

Carol Kennedy is a science teacher in the South Bronx. She lives north of New York City, and drives every day to teach students in the Bronx. Her story shows her background of growing up connected to nature, and how it has influenced her current approaches to educating urban students. Carol's teaching philosophy combines classroom learning with outdoor experiences in the city and elsewhere to connect students with their communities and the larger world. This interview illuminates her past work with students in a school garden, and focused on EcoLeaders, a 5-week environmental education program that Carol organized in summer 2010 to offer students a variety of urban nature-related learning experiences. Although Carol is the only public school teacher in our research whereas other educators are from community-based organizations, her EcoLeaders program with its multiple stewardship, inquiry, and exploration activities is representative of urban environmental education programs that use local places to educate students.

My name is Carol Kennedy, and I'm a teacher at the Arturo A. Schomburg Satellite Academy-Bronx, a small alternative, transfer high school in the South Bronx. . . . I felt it was really important to make connections between the school and surrounding communities. It was probably about 15 years ago that I got a group of kids, and we went to the community board and looked at maps of the area, searching for city-owned empty lots around the school. We found that right across the street from the school there was a city-owned plot. It was full of garbage, all sorts of weeds, shrubs, trees and all sorts of other stuff. We started the process of making this lot into a garden with Green Thumb. We started cleaning it up and eventually got some fences and other materials donated. Little kids, big kids from the community and staff from the school helped with the cleanup. Now, almost every year I can run a gardening and community activism class. The students spend a week out in the garden during our spring break doing cleanup, start the planting, visiting with local community groups, but most importantly, and they spend all this energy on making the garden look nice. And this carried

over when the class is over—the students feel a connection to the space and are angry when they feel folks in the neighborhood don't treat it with respect.

For a lot of new students [in the EcoLeaders program], as you might have noticed when we went out, this is the first time that they have done something like this—going out to the river, sitting by the river, going out in the water, collecting water samples, putting on waders and walking out into the water with the nets to catch the critters, holding them in their hands and looking at them. This is the first time for students to do this because it's not part of their life experience, this is something new and different for them. And for a lot of them it's like, "Hey, I hate the bugs, but let me hold the fish." At the same time they can enjoy some of it too. I'm hoping that they get this picture of the experience—which they will remember; I'm hoping that they can say to themselves, "I can do something and be successful. I enjoy myself in nature, and maybe I might want to do something like this in the future."

In the EcoLeaders program we did a lot of activities: planting seeds in the garden, exploring oysters with *Rocking the Boat*, doing a toxic tour of the community with Sustainable South Bronx, rowing on the Hudson River in my brother's community rowing club. . . . I have noticed that it's hard for students to get ideas about particular areas if you just show them a map, just talk about it or show pictures. It's hard if they are not out there to touch it and experience it. If you are not out there touching it or seeing it to make it concrete, it means nothing. Things like: "What are tides? Which direction does the water flow? Where is the source? Where is the mouth? What is upriver? What is downriver? What is north or south?" Those things don't make sense unless you are there to experience it or to put it in some context. I mean it took Stephanie, one of students, who took almost until the end to get a grip on what tides were until it she actually saw it over and over and it clicked, "Oh, these tides, oh, and that happens here every day too."

Another experience for EcoLeaders was in Drew Gardens at Phipps CDC, and working with the Bronx River Art Center. We broke the kids in half. Half stayed in the garden, got a tour with Jennifer Plewka from Drew Gardens who talked about all the different things found in the garden and its history. I thought one of the things she said was especially interesting, the one related to human aspects of a place that are so powerful for young folks. They may not remember the name of a plant, but they remember a certain tree in Drew Gardens was planted in memory of this person who passed away and whose ashes are under the tree, and flowers planted in memory of a child. Students could remember that story, which was told probably in the same amount of time as Jennifer might have talked about composting or anything else. But will they remember that? No. They remember that narrative about people and their lives—it's easier for students to incorporate and remember. It means something more to them, so that the garden means more to them in that sense. I agree 100 percent with that. That has been my experience as a teacher. Even if it's a made-up narrative, if I can put a narrative, a story to it, it means more.

I think that a lot of what I do comes from my really selfish need to replay things that have happened in my life, experiences that I had, and what works for me. I think a lot of teachers do that even though they don't acknowledge it, that this is the experience that they had in life and that's how they replay it when they become teachers. For me, part of why I did the EcoLeaders program and other activities is because I spent so much time exploring outside when I was a kid, because of my experiences with the world and learning things and I want to have other folks, my students, have those experiences as well. But then I try to rationalize with all sorts of education theories of what we are trying to do at Satellite. . . . I think students are going to have some concrete traditional experiences within the classroom. But they are also going to have this experience outside the classroom to understand the world they live in. And I want to ground it in the place where they are at, starting with the garden and building a connection between the students' lives and the community life. And once they have that connection, then they will be empowered, excited or energized to continue digging through the knowledge about this world and make some changes.

Similar to other educators, Carol's narrative illuminates two reasons to nurture ecological place meaning in urban environmental education (research question 1). First, Carol's and other educators' narratives reveal how place-based urban environmental education programs help students become familiar with and appreciative of their urban places, including nature-related phenomena and activities. In most narratives, educators link this familiarity with and appreciation of urban nature to students' psychological, physical, educational, or social well-being. Like some other interviewed educators, when Carol grew up she experienced undeveloped or nature-dominated landscapes, and now she wants her urban students to also have nature-based experiences, albeit in the city. More broadly, Carol is trying to help students understand the world they live in—starting from a community garden near their high school or tides in the Bronx River—in order to be able to make changes in this world and in their own lives. Further, Carol helps students reflect on the idea of biophilia and benefits of nature in the city, for example, by engaging students in interviews of visitors of the High Line park in Manhattan about why people value urban green spaces. In general, stories by other educators also demonstrated that they are conducting urban environmental education to help students enjoy the serenity of nature, benefit from unstructured time and play in nature, and use natural or managed landscapes as places to reflect, or use nature-based activities in cities to become more responsible citizens, open their eyes to natural treasures in their local environment, and appreciate their community for its existing ecological assets and processes.

Second, Carol's and other educators' educational practice is intended to foster students' imagination or sense of possibilities in regards to the future of urban neighborhoods, or students' own future in this environment. This intention is illustrated by Carol's attempts to engage students in improving their school garden, and helping students see other creative approaches to steward the urban environment, such as at the Eagle Street Rooftop Farm, the Science Barge, or the High Line park. Similarly, other educators are also teaching about temporality of places, and that students can re-imagine and eventually transform their neighborhoods—which is evidenced in this quote from Adam Green (educator, Rocking the Boat),

I wanted to empower young people by giving them a sense that they do have power and control, and you can make things happen. For example, right outside our door for years was the Cross Bronx Expressway. Kids did not know that it was not always a highway. Before it was a highway it was a neighborhood. Before it was a neighborhood it was farmland. Before it was farmland it was a forest. People made decisions every time it changed from forest to farmland to a neighborhood to a highway. And guess what, will it always be a highway? We are not stuck with it as it is. We can always change. And think about how it might reflect on me as a kid growing up in the South Bronx on my block, "This is it. I'm stuck. It's my reality." That's kind of the work I'm trying to do, to explain that our reality is only what we have decided, and that it can be changed.

In sum, in Carol's and other educators' narratives the main motivation or reason to develop ecological place meaning among urban students is to help them first, to understand what kind of place they live in, and especially understand, appreciate, and benefit from nature-related elements and activities in their urban environment. And second, to help them imagine what kind of place their neighborhoods could be: understand the changeable character of places, create ecological meanings of places that could inform action, and initiate steps to improve the urban environment.

Related to our second research question, Carol uses a variety of direct experiences of places to connect students to their urban environment. She recognizes that many students have rarely been

to such local places as the Bronx River, parks, and community gardens. Like other interviewed educators, Carol involves students in hands-on experiences such as environmental monitoring and community gardening. She also occasionally takes students to places outside the Bronx or even outside New York City, so that students can understand their urban places in relation or comparison to other urban and more rural areas. Another important aspect of connecting students to the urban environment in Carol's story relates to social experiences. For example, she has her students communicate with environmental activists, educators, or other students involved in environmental programs. Carol also finds it important to show students that there are many local community leaders and professionals such as scientists who study, improve, or advocate for the health of the local environment or natural areas in the city. Moreover, this and other narratives demonstrate that learning about urban places happens within a social context or social experiences, such as storytelling, interpretation, and activities with other students. Finally, an important theme in Carol's and other educators' narratives is influencing students' identity to develop ecological place meaning. For example, by calling her students "EcoLeaders" and giving them t-shirts with this label, Carol tries to influence how students see themselves, and thus how they see their role in their urban communities and their relation to environmental or natural elements in the city. Her activities aim to help students develop a stronger ecological identity, as reflected in a statement that she hopes to hear from students, "I can do something and be successful. I enjoy myself in nature, and maybe I might want to do something like this in the future." Through different stories, other educators demonstrate the same general values of and approaches to nurturing ecological place meaning.

An Example of Students' Narratives

Elizabeth Severino is a former student in the On-Water environmental education program at Rocking the Boat in the Bronx. Recently she began working in this organization as a program assistant. Rocking the Boat has helped her, as a student, to discover the urban environment, rivers, and animals. Elizabeth's story tells about her experiences on the Bronx River and other urban places, how her perception of the Bronx and New York City has changed as the result of participation in Rocking the Boat's programs, and how she shares her experiences with others.

My name is Elizabeth Alexandra Severino, but my friends and people at work call me Alex. I am 19 years old and I live in the Bronx on 225th Street and Broadway. My father is a proud Dominican, and my mother is originally from Curaçao, but she is of Dominican descent. I have a brother and a sister, who are much older than me, so I did not really have my siblings around because they were already in college. I was kind of alone, except for my parents. But when I was five I got a dog, and I named him Balto because of a Disney movie that I loved. Balto became my best friend. He was talking to me physically instead of verbally, "I don't want to eat right now, I'm going to sit on a couch." Since that time I wanted to work with animals. My interests jumped from veterinarian to wildlife veterinarian, to wildlife conservationist, to what I'm doing now on the Bronx River. Although I was always interested in environmental aspects, I never did anything with it. I was just going to a normal public school, some after-school programs, and home—the same things every day.

I have lived in a project housing near the Harlem River for at least 10 years now. . . . My apartment overlooks the Harlem River, but there is no access to that river. It's all fenced up and trains pass by, so you never can go to this river or at least you never thought you could. I always thought that Harlem River was the Hudson, but now I realize it isn't, the Harlem River actually expands to

the Hudson. Teachers never educate you about the rivers, parks, and your neighborhood, they just expect that you already know about it. The only park that you hear about once in a while is Central Park in Manhattan because it is in movies and shows, and that's pretty much it. When you go to school, they talk about different countries and the history of New York City. But they never talk about the environmental aspects of the city or its rivers and parks. Teachers don't tell you that hawks fly and catch some prey in the city. Tons of people still do not know it. No one in classes gives you the geographical aspect of where you live, they only tell you obvious information like the Statue of Liberty is one of few historical things that are being taken care of in the city.

In 2006, one of my friends told me about [an after-school education program at] Rocking the Boat, "Why don't you go to Rocking the Boat. We go rowing all the time," and I said, "Rowing? How do you row in the Bronx?" Then I joined the program, and became an after-school On-Water student. Since then I had a lot of discoveries because of Rocking the Boat. One of the first things I had was sailing with other students and educators on a 106-foot mast sailboat called Clearwater. We see sailing in movies like Pirates of the Caribbean, and I never thought I could go sailing in New York City. I did not think that people with mediocre lives would go sailing on 14-foot boats with five people. The first day I ever went sailing I was happy. I was the happiest person to sail along the Long Island Sound. We learned all the parts about the boat, and we were learning not in a classroom with a blackboard, we were learning on the boat, while it was moving. If you don't pay attention, you'll mess it up. And the best thing about a 14-foot boat is that when it slants all the way to one side. So you have to go all the way to your left side when the boat is going to be slanted to the right, and you see students running from one side of the boat to the other together in unison. If you don't do it, you will fall or get wet. Sometimes I was using the tiller and telling where the boat would go, which was so relaxing and therapeutic because you are doing something that not many teenagers are doing. One day we also went on a powerboat from the Bronx River to East River, then to Harlem River and the Hudson River. When we were on Harlem River I looked to my right and I saw my house in the Bronx, my area, and my apartment. I was like, "Am I on the river that I look at every day? I am on this river!"

Today we taught a group of students from Satellite Academy High School. There were some students in my boat who were enthusiastic about rowing. But you don't just go and row on these short trips with new people. We go to the river, and then I tell students a story about the river, how it was polluted and how it's getting better. If you just show students how to row, they will not care about the river. They will be eating a sandwich and drop trash in the river. But when we go and learn how to row, we always explain how we restore the river. I have picked up a bottle from the river as I told the Bronx River story. Students understand the story and start caring, and they see that they can make a difference. So, today some of these new students saw a plastic bag in the river, and picked it up. I did not ask them to get the bag. Did you see how one influence makes another happen?

I think that my experiences at Rocking the Boat have changed a lot what I think about the Bronx and the city. Many people say that where I live in the North Bronx is the best part of this borough, and that the South Bronx is where prostitutes and drug dealers are, especially in Hunts Point. When you think of Hunts Point, you think of a lot of factories, companies, and organizations. Even the Rocking the Boat building is in-between a garlic factory and a metal scrap recycling facility. You can see many trucks around here. On the top of the hill there is a community and churches, and on the bottom of the hill there are all these factories and the shop for cars blocking access to rivers. There is an invisible line between two realities, and so many people in the community don't see this industry next to their community. People wonder why their children have asthma. But now Hunts Point is becoming a very good environmental place. Now I just feel like I want to live here, it's the new place to go, it's becoming a greenbelt.

This story and other students' narratives provide insight into our second question about how students in environmental education programs in the Bronx develop ecological place meanings. Similar to all other interviewed students, before joining urban environmental education programs,

Elizabeth was unaware of natural assets in the Bronx. In her view, nature or the environment existed somewhere else outside the city, but not in the Bronx. An episode when she discovers how it feels to boat on the river near her house is an example of stories, in which urban students explore various “natural” areas in the city—through environmental monitoring, stewardship, recreation, unstructured time in urban ecosystems, and teaching other students about the urban environment. Through direct experiences, Elizabeth and other students discover that the Bronx has some of the largest parks in New York City, waterfalls, and the only freshwater river in the city. Yet students also encounter evidence of environmental problems in the Bronx such as air pollution, degraded rivers, and limited green space. They recognize negative place meanings of the Bronx related to environmental injustice, including meanings that are sometimes shared with them by people from outside the Bronx or taught in educational programs. While Elizabeth begins to appreciate and benefit from nature-related experiences, her narrative also shows how she begins to see the possibilities for positive environmental changes in the city, how she re-imagines the urban environment. For example, she tells other students how polluted the Bronx River used to be and how it is becoming better, and she believes that bringing more urban residents to the river will encourage them to take care of it. Sometimes, the urban environmental education programs help Elizabeth and other students observe how urban neighborhoods are becoming greener; and how their own stewardship activities in oyster reefs and urban farms can lead to environmental improvements. Elizabeth concludes that Hunts Point, a neighborhood in the South Bronx, “is becoming a very good environmental place” even though Rocking the Boat is located near a large metal recycling facility with trucks passing by on a regular basis. In other narratives, it becomes apparent how educational activities help students participate in designing greenways, and imagine what the Bronx would be with fewer highways and more open space.

While direct experiences of places seem to play an important role in nurturing Elizabeth’s ecological place meaning, her learning about urban places also is related to her social interactions with environmental professionals, and to changes in her own identity. The narratives show that if students participate for a few seasons in programs, they move from a position of novices in environmental education or community-based stewardship to more recognized young environmental leaders. They learn about the urban environment through networks that include environmental educators, professionals, scientists, local environmental leaders, and peer students. Her experiences with urban places are also connected to the development of her identity, especially to how other people in the Bronx recognize her as a young environmental leader. Narratives also show that all interviewed students come to think of themselves as capable of making change. Further, Elizabeth’s narrative demonstrates that her identity became defined in relation to the Bronx’s environment, her urban environmental education program, as well as her connections to Bronx environmental leaders. In sum, Elizabeth’s and other students’ narratives reveal that changes in their place meaning related to the Bronx reflect their place experiences, social interactions, and development of identity as environmental leaders—which resonates with results from educators’ narrative.

DISCUSSION

The sense of place literature has linked certain place meanings, and place attachment based on nature-related place meanings, to pro-environmental behavior and attitudes (Brehm et al., 2006; e.g., Brehm et al., 2013; Scannell & Gifford, 2010; J. W. Smith, Davenport, Anderson, & Leahy,

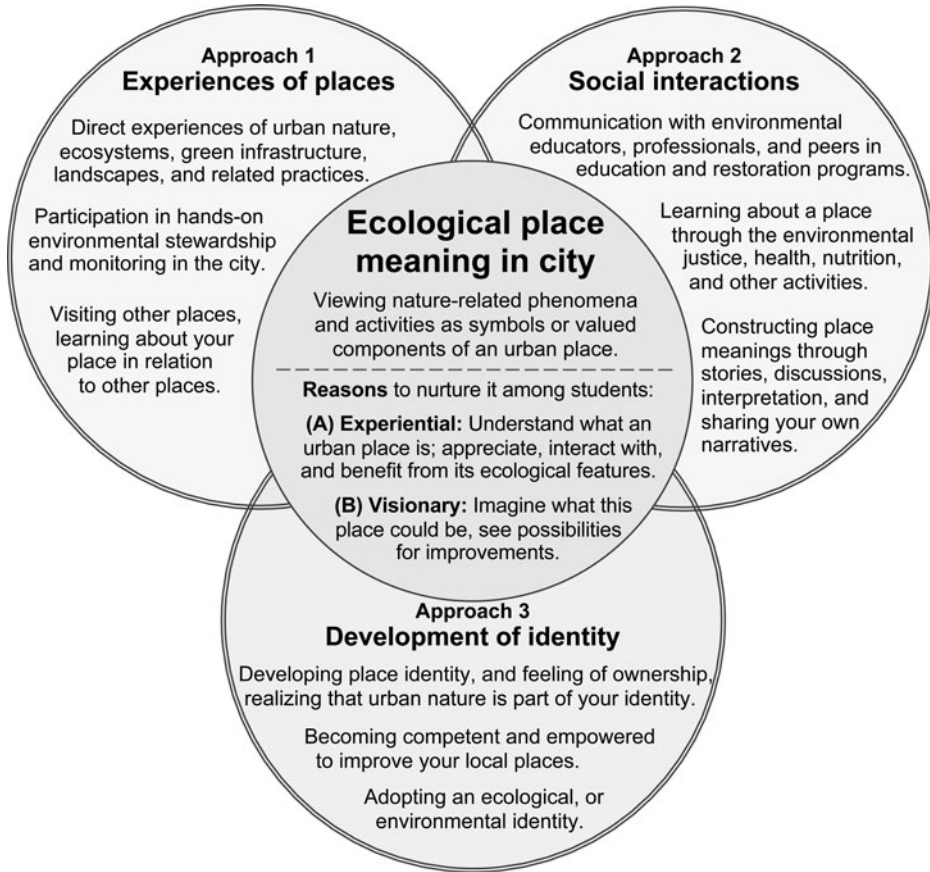


FIGURE 1 Reasons for and approaches to nurturing ecological place meaning among students in urban environmental education programs in the Bronx, New York City.

2011). Thus, one could hypothesize that environmental educators, perhaps intuitively, would try to foster ecological place meaning among urban students to promote pro-environmental behavior. However, the narratives in our study demonstrate that educators, who are trying to connect urban students to ecological features and activities of their neighborhoods, are motivated by a desire to help youth experience, appreciate, and benefit from urban nature, and to envision what their Bronx neighborhoods might be in the future (Figure 1). These experiential and vision-related reasons for developing ecological place meaning are perhaps less utilitarian and less emphasized than pro-environmental behavior often featured in the sense of place literature, yet appear to be important for educators. Both of these reasons are related to transforming the way students perceive urban places, and show the perceived importance of ecological place meaning in a cultural landscape.

The experiential reason to develop ecological place meaning—i.e., to enable students to notice, observe, understand, enjoy, or otherwise benefit from urban nature, ecosystems, green

infrastructure, and other environmental features and related activities in the city—has not been strongly emphasized in the sense of place literature within the natural resources and environmental education traditions, which instead has focused on the role of sense of place in fostering pro-environmental behavior. Yet this reason is consistent with place-based education, which focuses on helping students to learn from and connect to nature and other features of the local environment, and thus strengthen students' understanding of the world and their community (G. A. Smith & Sobel, 2010; Sobel, 2005). Related to these ideas, our narratives show that some students begin to enjoy themselves in outdoor and natural settings in the city, develop pride in already existing natural assets in their neighborhoods, develop shared nature-related experiences and memories with other students, establish meaningful connections with different places, and find nature-related and stewardship activities fulfilling. These outcomes also resonate with a youth development focus in environmental education, in which students' well-being is regarded as a more important outcome than pro-environmental behavior or attitudes (Schusler & Krasny, 2010). At the same time, most interviewed environmental educators in the Bronx remembered their own nature-related rural experiences as children, which may have motivated them to provide similar experiences for urban students. Interestingly, the emerging generation of urban environmental educators is increasingly growing up primarily in the city, including some of the interviewed students who as program assistants are mentoring younger students, and thus their idea of what counts as urban nature and ecological place meaning in the city may differ from those of the educators in this study.

The vision-related reason to develop ecological place meaning—i.e., to foster a sense of imagination and possibilities of what the city's environment, places, ecology, green infrastructure, and nature could be—also has not been emphasized in the literature. Narratives show that students are taught about the temporality of places, and that they observe how the urban environment is changing every year, discuss and create a future vision of the Bronx as a better place to live and experience nature, and think outside the box about the possibilities for environmental improvements. Whereas these activities may relate to positive youth development—through unleashing students' imagination and creative thinking about their places—they also may be intended to encourage students' future involvement in improvements of urban places. These ideas reverberate with Lutts's (1985, p. 40) question about promoting sense of place in environmental education by teaching students about the past, present, and future of a place: "Are we also teaching about the potential *futures*; helping people to recognize the alternatives, to choose those that preserve and create what they believe to be of value, and to act to bring this about?" In addition, this aspect of place meaning education resonates with Sanderson's (2009) idea that re-imagining our cities can motivate people to use urban spaces such as rooftops and waterfronts in a more sustainable fashion. Examples such as the newly created Concrete Plant Park in the Bronx (de Kadt, 2011), and the High Line park in Manhattan (La Farge, 2012), suggest the potential outcomes of community members re-imagining decaying urban infrastructure and valuing urban nature. On a more conceptual level, narratives demonstrate the possibility of creating new shared ecological place meanings that are visionary and not yet based on current physical characteristics of places.

As for the three identified approaches to the development of ecological place meaning (Figure 1), they are consistent with the sense of place literature in that place meanings are derived from experiences with biophysical landscapes (Stedman, 2003a), are socially constructed and learned through human interactions, interpretation, and cultures (Brandenburg & Carroll,

1995; Greider & Garkovich, 1994), and are influenced by self-identity or self-definition (Greider & Garkovich, 1994; Kyle & Chick, 2007; Kyle & Johnson, 2008). Narratives support, illustrate, and uncover the nuances of these three pathways for nurturing ecological place meaning by describing concrete educational practices and sharing related stories. For example, narratives show how students learn place meanings through place-based experiences: including excursions to new places when students just observe these places, and engaging in hands-on stewardship activities when students are changing familiar places. Further, students learn place meanings from other people's stories and explanations and through experiences shared with peers or personal place-based stories. Depending on types of educational activities, students may develop ecological place meanings that encompass notions of environmental justice, neighborhood history, environmental art, and community health and nutrition that perhaps cannot be learned solely by observing landscapes without interpretation or social learning. Finally, as students begin to identify with urban environmental features, they also begin to think of themselves as environmentalists or as people who can enjoy nature-related activities in the city, and develop a sense of ownership of urban places and feel competent or able to make positive changes in the urban environment.

Our findings that educators foster students' ecological place meanings to ensure student well-being and help them envision a more positive future suggest that the narrative research was an appropriate research approach for uncovering alternative interpretations of practices (Lejano, Ingram, & Ingram, 2013). Further, aside from answering our initial research questions, through the holistic representation of students' and educators' experiences, the narratives show the complexity of nurturing ecological place meaning. For example, we find that students sometimes have to reconcile conflicting place meanings, such as a view of the Bronx as green and sustainable yet environmentally degraded. Further, narratives contribute important nuances to the concept of ecological place meaning by showing that it may include not only understanding and appreciating current nature-related amenities, stories, and activities, but also a changing character and future greener vision of a place. Lastly, although our findings are admittedly context-specific and we are careful not to generalize beyond the educators and youth in our study, they can be useful in helping other educators to reflect on their own practices, and for scholars to build hypotheses for future research on the transformation of place meanings including in education and urban contexts.

CONCLUSION

In this study, we found that urban environmental educators in the Bronx, New York City are trying to embed urban places with ecological place meanings to enrich students' experiences and life, and to enable them to envision a better future for the urban environment. Educators' and students' narratives demonstrated that creating and modifying place meanings in a cultural landscape may require direct experiences with places, learning and co-creating place meanings through social interactions, and influencing one's self-identity. While strengthened ecological place meanings still may be conflicting with other urban place meanings and personal histories, viewing nature and environmental activities as important parts of the city may have implications for our feeling, understanding, and management of urban areas, and our well-being.

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