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Research Paper

'There's a meadow outside my workplace': A phenomenological exploration of aesthetics and green roofs in Chicago and Toronto

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HIGHLIGHTS

- Prairie green roofs can conflict with modernist city values.
- Prairie green roofs less liked but linked to fascination and well-being.
- Sedum green roofs not as interesting, worse outcomes for well-being.
- Green Roofs associated with care/attention and environmental restoration.
- Watching wilder green roofs linked to creative, meditative thinking.

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ABSTRACT

Green roofs are an increasingly popular urban greening strategy in North American cities. Most green roofs have been sedum-based, but there has been a recent trend to mimic the native habitat of a region in prairie-style green roofs. While this supports ecological restoration goals, it also conflicts with ambiguous responses by urbanites to the aesthetics of 'wild' and 'messy' nature in the city. Though green roofs are transforming downtown central business districts, there has been little research on office workers' perceptions of green roofs, or on how they may influence their health, well-being, and experience of central business districts. Furthermore, while recent research has looked at aesthetic perceptions of green roofs, there is scant qualitative work that explains why urbanites may have these preferences, or cultural and contextual factors influencing these perceptions. While not uncontroversial, green roofs make an excellent lens through which to explore the human relationship to nature in cities due to their lack of existing symbolism, challenge of the nature/city divide, and mimicking of native habitat. This paper explores office workers' perceptions of green roofs in Toronto and Chicago, two cities known for their leadership in green roof implementation. Using a phenomenological analysis of fifty-five semi-structured interviews, this paper examines (a) office workers' perceptions of green roofs; (b) how their lived experience influences their perceptions of aesthetics and urban nature, and (c) design implications for a more sustainable city. Results show that while 'wilder' prairie-style green roofs are not always well-liked, they are more likely to be associated with fascination, creative thinking, and calm well-being than sedum green roofs. Green roofs were also linked to an ethic of care and restoration, and may provide 'loose fit' places for respite and better health for office workers.

1. Introduction

As cities in North America both infill and sprawl outwards, many are seeking innovative solutions that address ecological goals and offer increased greenspace (City of Chicago, 2012; Thwaites, 2001). Green roofs' popularity is primarily due to their numerous ecological benefits such as the reduction of stormwater overflow and the urban heat island effect (Bliss, Neufeld, & Ries, 2009; Chih-Fang, 2008). More recently there is increasing interest in the potential for green roofs to mimic native habitat such as prairie (Butler, Butler, & Orians, 2012), as well as their potential to provide urbanites, and in particular office workers, with social and health benefits such as psychological restoration (Lee, Williams, Sargent, Farrell, & Williams, 2014). While this work has been promising in specifying aesthetic preferences (Jungels, Rakow, Allred, & Skelly, 2013) and their potential for restoration (White & Gatersleben, 2011), there has been scant qualitative research that examines *why* office

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workers have these aesthetic preferences, or underlying cultural and contextual factors that influence perceptions of green roofs, restoration, and urban nature. There has also been no work that examines perceptions of existing green roofs (versus images) in downtown central business districts. Qualitative work in this area is important given previous conflicts between popular urban aesthetics and ecological goals which have resulted in ambiguous responses to naturalized urban areas by residents (Gobster, 2000; Spears, 2005) and which can complicate the success of urban greening projects. Qualitative work is also important given that affective, emotional responses to nature may be key to understanding the role nature plays in sense of place and well-being (Hinds & Sparks, 2008; Korpela, Ylen, Tyrvainen, & Silvennoinen, 2009), but which are difficult to capture with quantitative methods (Perrin & Benassi, 2009). While green roofs are not uncontroversial (Henry & Frascaria-Lacoste, 2012) and are not always the best urban greening option, they are interesting as a case study through which to explore the human relationship with nature given their challenge of the traditional nature/city divide (Cronon, 1995), their lack of existing symbolism like mountains or forests (Saito, 2002b), and the current trend to use them to mimic native habitat.

This paper seeks to fill this gap in two ways: first, by reporting on new research examining office worker perceptions of green roofs in downtown Toronto and Chicago – two cities that are leaders in green roof implementation; and second, by using phenomenology and social constructionism to examine how participant perceptions of green roofs reveal underlying factors that may influence their relationship to urban nature. Through a phenomenological analysis of fifty-five semi-structured interviews, this paper asks (a) What do participants think and feel about green roofs; (b) how their lived experience influences their perceptions of aesthetics and urban nature; and (c) what are design implications for a more sustainable city? Key themes that emerged from the research include increased fascination and creative thinking with 'wilder' green roofs, even if not always preferred aesthetically; the conflict between 'messy' ecological aesthetics and the modernist city; and the difference between thought-out and felt, or affective responses to the green roofs. Understanding how we value and think about green roofs will help with urban greening and policy development, as well as contributing to our understanding of how nature affects our lived experience of cities, an issue of increasing importance as the world becomes more urbanized. Given the current importance of successfully incorporating ecological goals into urban greening projects, this paper also looks for ways in which insights from participants' experiences can be used to help develop an ecological aesthetic (in which ecological knowledge is combined with aesthetic preferences) advocated by Aldo Leopold and others (Carroll, 1993; Gobster, Nassauaer, Daniel, & Fry, 2007; Leopold, 1971) that still respects diverse preferences.

2. Current research on nature in cities, aesthetics, and green roofs

There are four main approaches to understanding the role of nature in cities that are relevant to this research: the ecosystems approach, the human benefit approach, the social constructionist approach, and intertwined throughout, the role aesthetics play in human-nature interactions. The ecosystems approach looks at how greenspace, and what types of greenspace, can be preserved or added to the city to reduce the urban heat island effect, stormwater overflow, and provide habitat for urban wildlife, among other benefits (Lee, Moon, Kim, Kim, & Han, 2013; Peng & Jim, 2013). This approach underlies the policy impetus for urban greening programs such as green roofs. Conflicts resulting from negative public perceptions of ecological restoration projects, (where damaged or destroyed ecosystems are restored by human intervention) (Gobster, 2000), or green roofs (Francis & Lorimer, 2011; Henry & Frascaria-Lacoste, 2012) have meant that aesthetics are also being recognized by cities as important to these project's success (Gobster et al., 2007).

The human benefit approach looks at multiple benefits of greenspace in the city, such as the social and health benefits of parks (Chiesura, 2004; Kaźmierczak, 2013) and greenways (Gobster, 1995). Most of this research demonstrates the psychologically restorative benefits of nearby nature for urban residents (Rachel Kaplan, 2007; S. Kaplan, 1995; Taylor, Kuo, & Sullivan, 2001). A subset of this research looks at aesthetic preferences for different types of nature (Kaplan & Kaplan, 2005; Ulrich, 1993), and argues that Anglo-Americans in particular tend to prefer large, mature trees, savannah-like grass and less 'messy' woodlands. The underlying theoretical premise for most of this work is from an evolutionary biology perspective in environmental psychology, and hypothesizes that these preferences are primarily innate and helped to ensure our evolutionary survival (Kaplan, 1995; Ulrich, 1993). Integral to this approach is the idea that humans are fascinated by nature through long contact with it during our evolutionary history which explains the prevalence of nature in our cultural symbols and mythologies (Kellert, 1993; McVay, 1993). Similarly, environmental values research claims humans have an implicit connection or emotional affinity towards nature that influences our motivations to protect it (Kals, Schumacher, & Montada, 1999; Schultz, Shriver, Tabanico, & Khanzian, 2004).

However, most social constructionists – who have long argued that the human relationship to 'nature' is socially mediated and constructed – reject the argument that our reactions to nature are innate. This third approach to the human relationship to nature deconstructs Anglo-American idealizations of wilderness (Merchant, 1995; Nash, 1982), the nature-city dualism (Cronon, 1995; Williams, 1973) and 'nature' itself (Braun, 2008; Castree & Braun, 1998; Smith, 1996) and is helpful in explaining conflicts over ecological restoration and naturalization projects (Gobster, 2000; Nassauer, 1995). Work in aesthetics has also deconstructed seemingly 'innate' landscape preferences, arguing that cultural, artistic and nation-building factors help prioritize the visual or tourist appreciation of dramatic, 'scenic' landscapes over nearby, messy, everyday landscapes (Saito, 2002a; Urry, 2005). Of particular relevance to this paper are two key arguments. The first, from social constructionists, is that 'nature' is a complex phenomenon, and that bringing 'nature' back to cities' first begs the question of 'which nature, and where?' This has been seen in idealizations of 'wildness' outside the city, for example rural cottage country, but the rejection of it as an aesthetic paradigm in the city, seen in naturalized lawns (Hough, 2004b; Wilson, 1991). Second, from aesthetics, is that aesthetic valuations of nature are not trivial but influenced by cognitive information – such as ecological knowledge and abstract thinking – and deeper emotional and psychological connections to nature (Hepburn, 1993). Hence both cognition and emotion are necessary to shift public perception towards an ecological aesthetic.

Research on green roofs has predominantly followed the ecology approach to studying urban nature, focusing on technical performance and ecosystem services (Blank et al., 2013). Though growing, only a small number of studies have looked at perceptions of green roofs. Scale and distance affect participant's perceptions and evaluations of green roofs (Lee & Koshimiz, 2004), while green roofs on residential buildings may increase beauty and restoration for participants, particularly for meadow-type or ivy roofs (White & Gattersleben, 2011). Office workers in downtown central business districts also prefer tall grasses, preferably green and flowering, over lower-growing red and succulent vegetation such as sedums, but prefer moderate versus high diversity in vegetation (Lee et al., 2014). In contrast, sedum-dominated or mixed-perennial

green roofs were preferred over grasses on botanic garden and university green roofs, with grasses seen as 'messy' and not fitting in as well with their surroundings. Green roof preferences here are also positively correlated with attitudes and green roof benefits (Jungels et al., 2013). Similarly, suburban residents dislike the 'messy' look of green roofs that contrasts with the standard suburban lawn aesthetic and have little interest in installing green roofs (Smith & Boyer, 2007). Student and residents in Spain also dislike messier green roof aesthetics, preferring a more careful design similar to a garden. They also tend to rate green roof aesthetics lower if they grew up in forested areas (Fernandez-Cañero, Emilsson, Fernandez-Barba, & Herrera Machuca, 2013). Lastly, low levels of awareness and knowledge about the benefits of green roofs have been found among suburban residents (Kuper, 2009) and landscape professionals (Calkins, 2005). Despite the call for more qualitative methodology to go beyond scenic preferences of nature (Gobster, 1999; Wilkie & Stavridou, 2013), only two studies have used qualitative methods. Yuen and Hien (2005) used focus groups, surveys and interviews to assess resident perceptions about a green roof on the deck of their building, finding that they used it to get away, have a place for children to play, and access to greenspace (Yuen & Hien, 2005). White and Gatersleben (2011) complemented their questionnaire with a small number of interviews, finding that interview participants were polarized in their aesthetic preferences, viewing lawn as neat or boring, and grasses as untidy or natural. Only Lee et al. (2014) examined the workplace, and none have looked at perceptions of respondents who both look out at a green roof and/or can access it physically. This paper aims to understand how office workers think and feel about real green roofs from their daily-lived experience, an important contribution given their proximity to many downtown green roofs and the current interest in workplace health and well-being (Lottrup, Grahn, & Stigsdotter, 2013). This approach not only addresses the current lack of qualitative research, but enables respondents to discuss how they feel about the green roof over time and different seasons, how the green roof fits (or not) into their ideas of nature – and thus whether nature studies can be applied to green roofs – and cultural valuations and attitudes that may be influencing their perception. This can provide more meaningful data for policy makers than likes and dislikes and contributes to research on the human relationship to nature.

3. Methods and case studies

3.1. Research design

A phenomenological approach was chosen for this study as it looks at the world as we experience it in an everyday way, not as we conceptualize or theorize it (Husserl, 1970, cited in Orbe, 2000). This is useful when examining something as complex as our relationship to nature, which, as has been demonstrated by social constructionists, is replete with cultural, social, and historical values that may seem inherent and natural. Phenomenology has also been used to explore health and well-being (McNamara, 2005) and sense of place (Relph, 1976), themes relevant to experiences of nature. Finally, phenomenology can be used to help explain aesthetic preferences by uncovering the essential, underlying thread or structure that unifies the lived experience of the phenomenon (Cresswell, 1998; Moustakas, 1994). Phenomenological methods emphasize a reflexive awareness of the practitioner's experience, philosophical framework and biases, called bracketing; in-depth interviews that aim to understand underlying factors influencing participants' experience but which may not be articulated yet; and both textural (what) and structural (how) descriptions of the experience (Cresswell, 1998).

Following Cresswell (1998), a matrix of the ontological, axiological, and methodological assumptions of literature relevant to the human relationship to nature in cities was developed. This matrix helped develop topic areas and a conceptual framework for the interview guide, provided a basis for the literature review, and helped the researcher be reflexive about my own biases, assumptions, and ontological frameworks (Cresswell, 1998; Padgett, 2008). For example, though I am committed to the success of ecologically oriented urban greening projects, this was set aside during the interviews and analysis. This matrix was then bracketed and set-aside until the interpretation phase. An interview guide (see Table 1) was developed and piloted with eight participants at one of the Toronto sites. The interview guide uses a combination of open-ended questions and standardized questions, such as health and stress measures modified from the Canadian Community Health Survey 3.1 and 1.1 (Canada, 2001, 2005), and the Canadian Community Health Survey: Mental Health and Well-being 1.2 (Canada, 2003). These measures allow for later comparisons with survey responses in the same population (Padgett, 2008) (Loder, 2011). The interview guide (see Table 1) has five main sections covering: (a) green roofs; (b) perceptions, attitudes, and experiences of nature; (c) nature and health; (d) workplace environment; and (e) health. The interview guide uses probes to make sure certain topic areas are covered (Padgett, 2008), and a hybrid funnelling and pyramid order which starts with easier questions and follows with more difficult or sensitive questions (Dunn, 2000). The goal of the interviews is to allow participants to respond in their own words and to draw out their narratives and lived experiences of nature, nature in the city, green roofs, and their health and well-being.

3.2. Case studies, sampling, and analysis

Both Toronto and Chicago have been promoting green roofs since 2000. They are frequently compared for their urban greening policies given their similar population size, climate, great-lake environmental problems and green roof policies (City of Toronto, 2007; Gorrie, 2007; Rothblatt, 1994). Though similar, they have a few differences relevant to this study. Chicago's green roof policies developed quickly through mayoral initiatives and were highly publicized, while Toronto's consensus-based process only really took off when their green roof by-law was passed in 2009 (Loder, 2011) (City of Toronto, 2009). Chicago's architecture, with repeated sightlines to the lake, extensive lakeshore parkland, and swimmable beaches make Chicagoans much more connected, symbolically and physically, to Lake Michigan than Torontonians are to Lake Ontario, which is separated from the city by an elevated expressway. Though Toronto has a few Blue Flag beaches (internationally certified for water quality) most of the population remains suspicious of Lake Ontario's water quality and few residents swim in it. Furthermore, the strong iconic presence of forested cottage country and a much-loved provincial park just north of Toronto, both classic symbols of Canadian wilderness, means that for many Torontonians 'nature' is generally imagined and valued as 'up north'. This symbolic value of forest is quite different than that of long-lost prairies for Chicagoans, which despite attempts to make the prairie native again (Meine, 2008), does not seem to have the same iconic power.

Toronto and Chicago's green roof leadership and similarities were the main impetus for their selection as case studies. Specific green roofs were selected through the criteria of being viewable by and/or being physically accessible to office workers in a downtown district, of having similar vegetation profiles, and of being accessible to the researcher as a result of contacts from work experience in the green roof industry. Determining which buildings overlooked or had access to the green roofs was done by a combination of archival research such as real estate databases and site visits. The Chicago

Table 1
Interview guide.

Key constructs	Indicator	Question	Probe
Green roofs	Green roofs Apathy/interest Knowledge	Have you ever heard of a green roof? What do you think about them? Do you know why they put up green roofs?	What have you heard about it?
	Level/type of access	Have you ever been on one?	
Attitudes and perceptions of nature	Apathy/interest/environmental attitudes	What comes to mind when 1 say the word "nature?"	Probe for strong memories, experiences, feelings
	Restoration, fascination, place attachment mood, affect	What kind of experiences have you had with nature?	How did you feel while you were there? Notice if make distinction between nature/Nature
	Urban nature versus Nature	Do you feel that nature affects how you feel about a place?	In what way? Can you give me an example?
	Place attachment and nature	Do you consider this green roof part of 'nature?'	Why/why not?
	Green roofs and nature		
Nature and health	Nature and effect on health	Do you feel that nature influences your health?	Probe for mood, why/why not, would anything else influence health, would it matter if the green roof was different
		Do you feel that the green roof impacts your health/well-being?	
Workplace and environment	Job type and level	Can you tell me about the work that you do?	Probe for hours worked, interest/satisfaction
	Potential stressors	Do you like your work?	Why/why not? Issues? Supportive/not supportive, able to concentrate/not, sunlight, ventilation, floor height
	Importance of factors relating to stress/anxiety	What kind of office environment do you work in? How could it be improved?	
Health	Health indicators	How healthy do you think you are?^	Compared to others your age? Why/why not, is there anything that reduces your stress/if nothing, what prevents you from being relaxed/what would you do
	Stress levels, influences other than work, importance of other factors influencing participants' health	How stressful is your life?^	
		What are major influences on your health?	What would improve it?

^ Sourced from the Canadian Community Health Survey 3.1 and 1.1 (Canada, 2001, 2005).

City hall green roof (see Fig. 1) – which is a prairie-style green roof, well-known and directly viewed by thousands of office workers – and a sedum roof also visible to office workers (161 N. Clark, see Fig. 3) were chosen as the Chicago case studies. In Toronto, green roofs on the Mountain Equipment Coop (MEC) (see Fig. 2), 401 Richmond (Fig. 4), and 215 Spadina (Fig. 5) were chosen as they are reasonably well-known in their area, have similar vegetation profiles, and are viewed by office workers. Three case studies were chosen in Toronto due to the smaller number and height of office buildings in an attempt at parity between the case studies. 401 Richmond and 215 Spadina are also accessible green roofs. Two of

Fig. 1. Chicago City Hall Green Roof.

Fig. 2. Green roof on Mountain Equipment Coop, Toronto.

Fig. 3. Sedum green roof on parking garage, Chicago.

the Toronto green roofs have prairie-style vegetation (215 Spadina and the MEC), while 401 Richmond is a sedum-style roof. In Chicago, the City hall green roof is meant to show municipal leadership, while the sedum roof is the first green roof required by municipal policies (personal communication, M. Berkshire, October 12th, 2012). In Toronto the green roofs are voluntary and meant to showcase private environmental leadership.

Given the exploratory and phenomenological nature of this research, the lack of previous research on office worker's knowledge of and perceptions of green roofs, and the practical complication of numerous private companies in each building for which permissions needed to be sought, a broad range of participants over

Fig. 4. Green roof on 401 Richmond (flat, sedum or grass-like roof).

Fig. 5. Green roof on 215 Spadina (meadow-like green roof with physical access).

many buildings was chosen as a research strategy instead of a randomized sample with a known total population in only one office. This research strategy – combined with a larger quantitative study on the same population (Loder, 2011) – provides a baseline of office workers' perceptions of green roofs in each downtown area and a basis for future research. Participants were selected based on their visual or physical access to one of the case study green roofs and were contacted using a snowball method (Curtis, Gesler, Smith, & Washburn, 2000; Patton, 2002) that included listservs and direct contact. A larger sample size was chosen given the number of buildings involved in the study, with recruitment continuing until saturation was reached, with 26 participants in Toronto, 29 in Chicago, and approximately equal numbers of men and women. Though participants were sought across a representative stratum of income and ethnicity, the populations in each case study are predominantly white and middle to upper income, which is representative of these work neighbourhoods but less wealthy and diverse than Toronto or Chicago's populations. Interview participants were found from most of the thirty-four participating buildings, however, giving a broad range of participant access and experience of the green roofs.

It was also difficult to solicit participation from those who did not have access to the green roof or who were less interested in urban greening, and thus the participant sample may be somewhat more 'green' than the general population, particularly in Toronto where the offices tend to be non-profits and arts media.

Multiple site visits by the researcher resulted in fifty-five semi-structured interviews conducted over the course of a year, lasting anywhere from twenty to sixty minutes long. Interviews were transcribed and inputted into NVivo. Codes were developed from a close and repeated reading of the transcripts for meaning units and then gradually organized into themes in a hierarchical matrix over the course of several months. Strategies for rigour and trustworthiness include prolonged engagement with the areas; constant checking back with the data to test for negative cases and subsequent revision of the emergent themes; member checking on interpretation of their data; journal keeping by the researcher for reflexivity and the inclusion of non-verbal cues; and triangulation from comparison with responses from the larger survey (Baxter & Eyles, 1997; Cresswell, 1998).

4. Results

In general, most participants associated green roofs with some sort of environmental benefit, mainly due to the association of plants and greenery with the mitigation of air pollution. Green roofs

were also generally thought to be a good idea. In addition to aesthetics, the size, scale, and distance of the green roof from participants also strongly mediated their responses. For example, those who looked out directly onto a green roof, particularly at eye level, indicated that the green roof made much more of an impact on their daily experience than if they could only see a small sliver in the distance. The environmental values of the participants and political context also influenced their perception of the green roofs, though not always in the same way. These mitigating factors influenced the responses and the five themes that emerged from participant perceptions of green roofs: aesthetics, fascination, green roofs as part of 'nature' (or not), symbolism, and well-being. All participants have been given pseudonyms to protect their identity, and Toronto and Chicago are discussed together unless the responses warrant separate treatment

4.1. Aesthetics

What role does aesthetics play in mediating office workers' perceptions of green roofs and urban nature? Results from the interviews indicate the key roles native habitat, expectation, control, access and close watching over time have on aesthetic perceptions. All of the participants agreed that the green roof was preferable to looking out at a black tar or gravel roof, but there was considerable ambiguity on whether participants liked the aesthetics of the roof. Though the prairie is long-gone for most of the Midwest, except in neglected patches (Gobster, 2001), most Chicago participants recognized the city hall green roof as a prairie aesthetic: "*. . .this one gives the appearance of you're driving down a country road and there's that prairie and it's completely overgrown and it's very wild and very – it's just very wild-looking.*" (Zsolt, Chicago). The MEC green roof in Toronto also has a prairie aesthetic, but this was really only recognized by participants who had grown up in the prairies: "*. . .but I'm sure every time that I see it subconsciously, it reminds me of a natural prairie setting.*" (Tom, Toronto). While some participants found the prairie aesthetic wild, beautiful, and intriguing, many also found it messy, unkempt, and too 'wild looking':

> It seems not very well maintained, not very well landscaped, but I'm no expert. . .. This particular green roof it seems weedy, it seems almost like they're just letting it grow naturally and not really putting a lot of care in it, but then who knows?. . . Just looking at it, it looks like a bit of an overgrown prairie that's not being maintained properly. (Zsolt, Chicago)

This acknowledgement that the 'natural' aesthetic may be on purpose, but was not preferred, was common among participants, especially in Chicago. The green roof was contrasted less favourably with the bright colours and order of the median planters that were part of the former Mayor Daley's urban revitalization in the loop business district.

Chicago participants who only experienced the green roof visually found the more manicured aesthetic common to a sedum green roof - especially at a distance - not nearly as interesting or appealing, despite these same participants' dislike of the messy quality of the 'prairie' green roof. The green roof on 161 N. Clark was found to be half-finished, unappealing, and less intriguing:

> . . .it doesn't entice you to dig further and deeper into it to understand the system. So for that green roof over on the parking garage, it doesn't invoke anything. It's just 'eh', where it just looks like someone spit up carpet or grass on a roof and that's about it, whereas at least the one on City hall, yeah it's not accessible, but from those that can view it, at least evokes something. (Bethany, Chicago)

Thus though the prairie aesthetic was not always understood or liked, participants found it more interesting and engaging than a manicured, or lawn, aesthetic.

Participants' dislike of the messy aesthetics of the prairie-style green roof may be partly due to expectations participants had about what kind of 'nature' to expect in the city, and where:

> And I suppose if I'm the wilds, I don't expect – maybe it's based on expectation. If I'm in the wilds, I don't expect to see a beautiful cultivated garden or plants or everything in perfect order. . .but I do love being out in the wilderness and in there, that's what I expect. . .. In the city, I'm thinking more about what's uniform and again, what I find to be beautiful. . . flowers to look at and I don't see that up there. (Mark, Chicago)

This idea of expectation also brings up the issue of control in the city:

> I think there's a lot of ways to control a city environment, and I think that's one of the reasons why it's not as conducive to clear thought because you're always thinking, "If that person would just shut off their iPod then I'd maybe be able to focus on what I need to read. . . here.", or something like that. Where you don't have any control over that cricket. You can't turn off that cricket, so you accept it and it becomes part of your environment. . .. If you accept that crickets have to be chirping and the stars have to be out and that the wind has to be blowing at whatever speed it's blowing, then it just becomes part of you with what's around you and essentially part of what you are. (Tim, Chicago)

Interestingly, participants who had physical access to a green roof with a similar aesthetic or who had close visual access said that they started to understand why it was left natural:

> At first, I thought it was kind of weird that they don't really. . . tend to it or have it like a garden and I'm like, "Well, I guess it's not a roof then.", like a green roof where. . ., but now I do understand. Letting it. . .It's just more natural. (Jane, Toronto)

This raises the issue of the influence of access to the green roof on participants' perceptions. Participants who were further away from the green roof could not see much detail, colour, or variation, resulting in surprise for those participants who subsequently visited the roof:

> And then to come up and see all this diversity of plants and the 'nature' that's using it, then it kind of connects for them. They go, "Oh, this is just like a wild lands in a park" or some cottage area where they go to or something. They can connect that. They see, "Oh, nature would use this as a stopping place to get to the lake or to continue on somewhere, bees for pollinating" and that sort of thing. (Robert, Toronto)

This direct experience of the variety of plant and animal life that exists on the roof usually resulted in more appreciation and understanding of the purpose and rhythm of the naturalized green roof, particularly if birds or bees used it as habitat. This appreciation was particularly apparent in participants who had a strong environmental awareness, expressed as concern about and interest in environmental issues.

Environmental education also influenced participant perceptions. Those participants who assumed or had heard the green roof was installed for energy efficiency or storm water management reasons also assumed that the naturalized aesthetic had some environmental rationale and was not intended to be pretty. This was true in Chicago where green roofs were more widely promoted as helping to reduce energy costs by the City and in Toronto where the green roof was assumed to reflect the environmental values of the building owners.

4.2. Surprise and fascination

The relative novelty of green roofs in the North American urban aesthetic landscape was reflected in participants' surprise over the green roof when they first saw it, surprise that vegetation could exist in a landscape of mostly glass, steel and concrete:

> Well, it's just like this piece of concentrated vegetation existing. . . I see just looking out the window right now, I see a few trees, but mostly I just see concrete, metal, cars, buildings and stuff, but I don't really see any vegetation out there, right? So it's hard to believe that it can exist where there's really no – what's the word I'm looking for? It doesn't seem this type of environment would be conducive for vegetation to exist in. (John, Toronto)

Many participants, particularly those who saw any sign of nature in the city as a sign of hope or progress, also viewed the green roof with delight:

> When I look. . . to the Mayor's garden, it's a positive experience. I just feel a certain sense of delight and a little bit of smugness that, here we are in the middle of the city and yet we get to see this green thing. So, I think psychologically it certainly is a positive thing. (Peter, Chicago)

On a daily basis many participants found themselves attracted to the green roof almost unconsciously. They would be chatting on the phone, or looking out over the cityscape, and would find their eyes drawn to the roof:

> What always will happen is when you're on the phone and you have a chair that has wheels on it, just by force of habit, you'll be – you know, your mind will be elsewhere, but you'll happen to just kind of – when I find myself noticing it, I instinctually am drawn to it or continue to look at it without thinking about it, with my head completely somewhere else, but I will stay focused on it just out of some, I think, truly, just natural, instinctive pleasure that I derive from plants and nature. (Zsolt, Chicago)

This fascination and pleasure in viewing nature also meant that many participants actively sought the green roof out of curiosity – was anything different? Had anything changed? For many office workers, the green roof was one of the only cues to seasonal change from their windows. For those with close access to the green roof, the view proved particularly fascinating: "*Even when it's windy and raining, it's – there's something going on across the roof. . .just staring at it, it's just beautiful, you know, and the colours*." (Jennifer, Chicago). This close watching strongly influenced whether or not participants felt that the green roof was part of nature.

4.3. Green roofs = nature?

Whether or not green roofs were part of nature revealed the ambiguity many participants felt about the human relationship with nature. While some felt that the presence of wildlife or plants, something 'wild', meant that it was nature- "*Oh, of course! They've got bees!*" (Melanie, Chicago), others felt that the obvious role of humans in creating a green roof moderated the 'nature' aspect of green roofs. This meant that green roofs were seen to be an attempt at nature, but not the real thing: "*. . .um. . .I want to say yes, but I feel it's implemented nature.*" (Judy, Toronto). Partly this reflects the ambiguity of 'nature' as both a place and a thing, or 'Nature' versus 'nature:'

> Um. . ..Is the green roof part of nature?. . . Yeah. I mean, it's, it's trees and plants. It's not nature for me in terms of being my vision – when you say what does nature evoke visually for you, nature is the untouched world. If you say, "I'm going out into nature", that doesn't mean I'm coming out to the green roof. That means I'm going out into, you know, camping or out into the woods. If I'm coming out to the green roof, that's a man-made construct. That, um, it's nice. It's lovely. It's green and everything, but that, to me, isn't nature. (June, Toronto)

Central to this perspective is the aesthetic experience of the juxtaposition of the green roof with densely clustered urban built form, which some participants felt reduced its immersive, natural effect:

> So, is that like nature? A little bit, but it's hard for me to say, 'Oh, yeah. I feel like I'm in a nature preserve.' because I can't look at that without seeing concrete all around me and buildings. (Mark, Chicago).

For these participants nature is something you immerse yourself in, can touch, smell, and experience more than visually, a sentiment echoed by Joe: "*. . .would I consider it part of nature? I think, you know what, if I went up there and sat down in the grass and read a book and enjoyed it, then yes, I would consider it part of nature*." (Joe, Toronto). Though much of this confusion centres on the influence of scale and access, underlying many participants' responses is an ambiguity around how they felt versus thought about the green roof:

> It feels like it is (part of nature). I think that there's this conscious separation for me that says it's not specifically nature probably because I knew it was constructed and planned and put together rather than just happening on its own. But I think the end result feeling is that it's a part of nature when it's all done. (Dolores, Chicago)

Lastly, participants with strong environmental values either saw the green roof as mitigating or compensating for environmental damage wrought by humans, or as not nearly enough given the destruction of wilderness and habitat outside the city. In this sense green roofs were symbolic of larger environmental values.

4.4. Green roofs and symbolism

Green roofs do not have the symbolism associated with more traditional forms of nature, such as forest or lakes. Instead, participants viewed green roofs as symbolic of the values and intention of the person or organization assumed to be responsible for their implementation. In Chicago, this was the former Mayor Daley, and the City hall green roof was often referred to as "*. . .the Mayor's garden*."(Anna, Chicago). This is due largely to the high level of publicity around green roofs as a mayoral initiative, but it is also due to the larger programme of urban greening and revitalization in Chicago of which green roofs were assumed to be a part: "*So when I saw the Green Roof, it just was another extension of what seemed like all these wonderful things that Chicago was doing to bring flowers and green and trees into the city*." (Dolores, Chicago). This greening was strongly associated with a sense of pride that the mayor was promoting environmental initiatives that improved both the public experience of the city and showcased Chicago to the world as progressive and green:

> And I think people are more proud today to be Chicagoans in no small part because of the greening of the city. I mean, it is a *beautiful* city. . ..I think they enjoy the experience more because it's greener. I know I do. I know I, you know, I can't put my finger on the tangible effects of it, but you just *feel* different when you can run around the city and see these greening initiatives. It's, it's great. People *love* to come here, and you want to be proud of

> your city as a Chicagoan. We've always been proud of Chicago as an architectural landmark and architectural template. . ., and to be able to wed that to greenery that lives up to that standard of architectural. . . excellence is nice. It really makes Chicago a global city, and as a citizen, you always want to be proud of your city. (Donald, Chicago)

Green roofs and other greening initiatives thus became symbolic that someone cared about participants' aesthetic lived experience of the city and shared their environmental values.

In Toronto green roofs were also associated with the organization assumed to be responsible for their implementation, in this case the MEC or the owners of 401 Richmond and 215 Spadina: "*. . .I thought that the MEC Building, which has, I guess, a Green Roof,. . . was something unique to them in that it was part of their, I guess, motif or branding to be environmentally friendly*." (Matthew, Toronto). As in Chicago, participants saw the green roof as reflecting their own environmental values, and in particular as compensation and recovery for human destruction of the environment:

> Well, my understanding about green roofing and all of that is it's a sustainability project that many cities have adopted, and it's like a replacement. . ..Because we are expanding our cities quite a bit and there is a lot of greenery that is being lost or not preserved within the city. (Elaine, Toronto)

This association of green roofs with recovery and the organization which installed them reflects green roofs as placeholder for the environmental values of the participants. This was often linked to a sense of hope and well-being.

4.5. Green roofs and well-being

Asking participants about the relationship between green roofs and their health is complicated by ambiguity over whether green roofs are part of nature and the differentiation between health and well-being. For those who felt that 'nature' needed to be immersive and large-scale to be beneficial, or that nature was a place, green roofs were not generally viewed as affecting their health. These participants expressed the desire for the green roof to be accessible, and for the need for more green roofs, for any health benefits to be felt. They interpreted both health and green roofs in a very literal, scale-oriented way: one green roof will not clean the air as much as many green roofs, and clean air impacts one's physical health. This physical interpretation meant that while many of the participants found the green roof made them feel better, they didn't necessarily associate 'feeling better' with their health:

> It made you feel better. I don't want to say it influenced my health. . . But, yes, – if it reduces your stress, I guess it would affect your health. I never thought of it in those terms. But it definitely made you feel better. (Hugo, Chicago).

However, it is in these more qualitative, affective responses where some of the more interesting perceptions about green roofs and well-being emerge. For example, most participants found that the green roof broke up the aesthetic monotony and hardness of the concrete city:

> Breaking the grayness, the hardness of the city, . . . these rooftop gardens would be a part of that. . .So, I respond to aesthetics. Something that looks nice, something that breaks the monotony, something that is intriguing that'll have me stop for a moment and look at something. (Peter, Chicago)

This softening of the city provided a balancing and release against the stress of the CBD: "*It's a balancing and kind of emotional release to look out and see a garden versus concrete everywhere*" (Iris, Chicago). Participants also often mentioned the calming effect of the presence of the green roof: "*I do believe that having green roofs, or having trees on top of buildings brings a bit of a calmness to people, and that reality check of not just buildings, and coldness, and corporate world*" (Jackie, Toronto). Though participants who had access to the green roof found more stress relief, even looking out the window at the green roof provided an escape from the stresses of long hours at the office and numerous demands on participants' time:

> Um, It just kind of gives me just a sense, like a few minutes of quiet. I can, you know,–I find it easier to reflect looking at something, some tree or a plant or flowers, a field and that's kind of what it reminds me of. It reminds me of a meadow or something. (Elaine, Toronto)

This ability of the green roof to evoke other nature experiences, such as reminding them of a meadow, often brought participants back to a happier time, often in childhood:

> I think that it exudes the same feelings of that I would've gotten when I went out into the woods when I was growing up. When I enjoy the green roof, when I enjoy the Chicago planters, it's that same sort of happy, free spirit feeling that things are good, things are beautiful. (Dolores, Chicago)

Gazing out at the green roof also helped them gain perspective in their work and to creatively solve problems. Participants mentioned that the green roof helped them to "*. . .get back to basics*" (Melanie, Chicago), put things into perspective (Maurice, Chicago) and clear their head to better approach their work (Jane, Toronto). Lastly, the presence of the green roof gave many participants a sense of hope about a re-balancing of the natural and human-made world: "*But I feel hope. I guess I feel hope when I come up here. I think people are making an effort to try and reintegrate environmental considerations into our built world and that makes me feel hopeful.*" (June, Toronto). These more affective, nuanced perceptions of the relationship between green roofs and participants' health and well-being point to possible ways to understand how aesthetics mediates their relationship with nature in cities.

5. Discussion

How do the insights from social constructionism and phenomenology help us to understand a); how these office workers' responses contribute to literature on perceptions and preferences of green roofs; b) point to possible cultural factors influencing these preferences; and c) offer insight into key components of their daily lived experience that shape their perceptions of aesthetics and their relationship to urban nature?

Participant's mixed reactions to the aesthetics of the green roofs echo the differing aesthetic preferences found by recent green roof studies where either grasses (Lee et al., 2014; White & Gatersleben, 2011) or sedums (Jungels et al., 2013) were preferred. While other studies have linked socio-demographic and group variables to aesthetic preferences (Van den Berg, Vlek, & Coeterier, 1998), these did not emerge as important factors in the interviews. Participant responses, however, point to possible cultural influences on these aesthetic perceptions, and challenge the idea that these preferences are either innate or only individual variations. The recurring association of prairie-style vegetation with ecological restoration supports work that argues aesthetic preferences are malleable with education (Gobster et al., 2007), particularly since participants' knowledge of the environmental benefits of green roofs often led to an increased acceptance of a prairie aesthetic. Conversely, the association of prairie-style green roofs with messiness and a lack of maintenance may point to the Victorian legacy of public health and

sanitation which has linked 'messiness' and 'wildness' with neglect and ill-health (Hough, 2004a; Nassauer, 1995). It also may link to the association of straight lines and order with the modernist city ideals of planning, beautification, economic progress, and control (Kaika, 2006). In addition, participants' expectation of 'wild' nature outside the city, but neat, colourful nature within it reflects the elevation of the scenic, or tourist aesthetic instrumental to North American nation building over local, lived, and messy nature (Saito, 2002b; Urry, 2005). Thus a green roof turning brown during a dry season can signal neglect and death, not the normal changes of grassland. In this way the prairie aesthetic in the city seems to challenge the expectation of 'nature' as 'out there,' far away and unchanging, a hyperreal scenic frozen ideal that lacks the in-depth, intimate knowledge of the lived experience of place and ecological processes (Cronon, 1995; Foster, 2000; Gobster et al., 2007). Though sedums can also have visual interest, they lack an association with native habitat and their detail is often not visible from a distance, making them stand out less among a mass of tall buildings. This may explain participants' lukewarm or neutral reactions to their aesthetics, particularly in Chicago.

Participant ambiguity over whether 'nature' clearly manipulated by humans (i.e. planted on a roof) could count as real 'Nature' also mirrors ecological restoration debates in which preservationists advocate that real 'Nature' is outside the city, ideally untouched by humans and not replicable once destroyed, while restorationists imagine a more reciprocal, active relationship between humans and nature through care and labour (Elliot, 2000; Hull & Robertson, 2000). Thus, though current urban greening goals are to bring 'nature' back to the city, this may conflict with inherited Anglo-American messaging about the necessary nature/city separation for the goals of economic progress and human and ecological health.

What insights can be gained from a phenomenological perspective about participants' aesthetic perceptions of green roofs and urban nature? Central to participants' experiences are the concepts of fascination over time, wildness, and intention. Participant fascination with green roofs – even when they were unsure, or even disliked the aesthetics – supports work in environmental psychology, biophilia, and environmental values that argues that humans are not indifferent to the natural world and are implicitly drawn to it, even in dense urban settings (Schultz et al., 2004; Ulrich, 1993; van den Berg, Koole, & van der Wulp, 2003; Wilson, 1993). A phenomenological perspective, however, reveals the role that close watching over time played in participant perceptions. Participants who watched the green roof over time and who were close enough to notice detail and seasonal change expressed recognition of otherness and wildness, separate from the concrete and glass buildings. This watching over time often led to a letting go of ideas about what the green roof should or should not be, what it should look like, what it should do; in short, to a letting the green roof *be as it is*, paralleling a more phenomenological way of viewing the world that tries to let things unfold in their own way in the world, while letting the categories we impose on things fall away (Heidegger, 1971). This kind of knowing has been called a meditative versus calculative way of thinking (Heidegger, 1966; Stefanovic, 1991), and is in direct contrast with the kind of thinking required in many workplaces and encouraged by sharp-edged, efficient urban landscapes. However, meditative thinking *is* conducive to creative work and problem solving and may help to develop an ecological aesthetic that blends knowledge with aesthetics and fosters a closer, deeper relationship with nature (Gobster, 1999; Leopold, 1971). If research shows that other urbanites have similar lived experiences from close contact with green roofs or other ecologically-oriented urban greening projects, then these projects may provide opportunities to shift aesthetic preferences from a scenic, or tourist aesthetic to an ecological one. Furthermore, meditative thinking challenges the expectation of control expressed by participants and returns a sense of agency to nature (Brady, 2006) which can lead to a sense of calmness, peace and thus well-being. Insights from those participants who were able to watch the green roof closely over time therefore support some suggestions in phenomenology that nature can serve as a possible vehicle, or cue, to this kind of knowing and awareness (Stefanovic, 1991).

Meditative versus calculative thinking also seems to be key in participant's perceptions of whether green roofs are nature or not and have the same benefits as 'Nature.' While environmental knowledge can affect aesthetic preferences, it does not explain the struggle many participants had with their conscious, thought-out understanding of nature, i.e. as a place untouched by humans and thus 'wild,' versus their more affective, immediate perception of the green roof that came from a more meditative watching. This kind of knowing supports work in aesthetics that argues we understand aesthetics and nature through both cognitive and affective pathways (Hepburn, 1993), but it also speaks to the importance of implicit, felt connections to nature that are mediated, but not determined, by aesthetics and culture. Participants who watched the green roof over time were more likely to 'feel' that the green roof was part of nature, that it influenced their health and well-being, and associated green roofs with the sense of connection, calm, and a mental break commonly associated with larger experiences in nature highlighted by environmental psychologists (Kaplan, 1995; Krenichyn, 2006). Though urban greening projects do not have the scale of forests or mountains, there can be awe and inspiration found in the hiddenness and minute details of 'nature' (Wilson, 1993). This understanding of different ecological scales and processes can deepen the human relationship to nature (Gobster et al., 2007; Hepburn, 1993). In this sense the experience of otherness, or wildness, in nature may be key to whether or not urban greening projects have similar health benefits as 'Nature.' This perspective avoids the nature/city dualism and highlights the key role of emotion in the human relationship to nature in the city.

Lastly, a phenomenological analysis reveals the sensitivity of participants to the perceived *intention* behind the green roof. This may help to explain why for Chicago participants, though the sedum green roof fit into participant expectations of control and order in the city, it was less liked due to the perception that not as much effort was put into it. While this feeling may have been influenced by the modular style of sedum roof on 161 N. Clark, it also seems to be due to aesthetics and perceived effort. The sedum green roof had to cover at least fifty percent of the roof under Chicago's policies, and according to city planners, the building owners installed only the minimum required (personal communication, M. Berkshire, October 12th, 2012). This effort was picked up on by almost all the Chicago participants. Toronto participants who had physical access to the roof and who associated it with environmental initiatives were less negative about the sedum roof. However, though the prairie-style green roofs were seen as 'messy' and possibly not as maintained as they 'should' be, they also had visibly more detail (even from a distance), design work, and ongoing maintenance – whether from path patterns on the Chicago city hall, physical access and terracing on the Robertson building, or regular tours and maintenance crews on all three. The reference to prairie ecologies outside the city also seems to have influenced many participants' perception of green roofs as a symbol of restoration, hope, and care, even if mismanaged by the City; that someone had thought about and put effort towards the quality of urban public life, public health, and larger environmental issues. This sense of hope and restoration, of pride in their city is linked to larger debates around the quality of life and public space in cities and of a collective well-being and sense of place. The fatigue of concrete, glass and steel, of long hours with little to no access to fresh air and greenspace, and the view of tar roofs, dead birds, and mechanical equipment, all reveal the context in which

these participants experience green roofs in the city, and how the unexpected presence of meadows in the sky can give some of them a sense of calmness, hope, and respite.

5.1. Sampling, methodological, and ethical issues

Phenomenology as a method looks for essential underlying themes that can provide insight into the human condition – in this case the human relationship with aesthetics and urban nature. Though previous research on the human relationship to nature has found commonalities across socio-economic and ethnic lines (Gobster, 1998; Kaplan & Talbot, 1988), the limited ethnic and socio-economic characteristics of the sample population, and the possibility of self-selection by those who tend to be more interested in nature and 'green' issues, means that the above insights may only be applicable to similar populations until further research can test these themes on different populations. This paper also looks at possible ways to 'shape' or encourage an ecological aesthetic that may increase the chance of success for urban greening programmes that have explicit ecological goals. This is an ethically difficult position for a researcher, but chosen given the pressing need for cities to find successful climate change mitigation and adaptation strategies, many of which depend on popular acceptance. This paper has tried to find balance between respecting the diversity of participant perceptions and looking for ways to encourage acceptance of more ecological urban greening projects.

5.2. Design implications for the sustainable city

Participant experiences of green roofs raise questions about the kind of urban spaces that could provide opportunities for a moment of respite, of creative thinking, of being fascinated by the otherness of something during the workday which may lead to more creative problem-solving and health benefits. In this sense, four ideas may be of interest to policy makers and landscape designers.

First, participants' association of prairie-style green roofs with native habitat raises interesting questions about the relationship between the experience of local nature and aesthetics in the city. Here a phenomenological attention to absence and relations between things, rather than just what is visible and measurable, might be helpful in explaining the role urban greening can have. The symbolism and visual appeal of green roofs can be used to promote both larger environmental initiatives, as Chicago is doing, as well as provide aesthetic cues that 'prairie' is as local as Lake Michigan or iconic skyscrapers. This would support the work of Chicago Wilderness, a local non-profit that aims to make the prairie native again to Chicagoans through projects such as ecological restoration and habitat development (Meine, 2008). Given the lower rating of green roofs by those who grew up in forested areas (Fernandez-Cañero et al., 2013), it is unclear whether this would work for cities like Toronto, whose native habitat is dominated by vast forests and lakes north of the city. And while both cities have made concerted efforts to provide equitable access to urban greening initiatives (Loder, 2011), working poor minorities who may justifiably associate green roofs and other urban greening projects with elitism and upcoming gentrification (Montalto et al., 2013) may be less enthusiastic about attempts to link urban greening projects to native habitat. If Toronto and Chicago do continue to work towards equitable urban greening programmes, however, then Toronto's aggressive promotion of municipal environmental initiatives - such as green habitat corridors and biodiversity guidelines for green roofs – may be a good model for incorporating green roofs into already-existing ecological restoration initiatives (Torrance, Bass, MacIvor, & McGlade, 2013). Addressing the role of native habitat in mediating aesthetic perceptions of green roofs might therefore help policy makers to align local urban greening projects with larger ecological goals and place-making.

Second, green roofs may provide unique possibilities for creatively breaking the harsh edges of the modernist city, which participants found fatiguing. Specifically, the unexpected wildness and otherness of the green roofs may be more startling *because* they are juxtaposed with the order, control, and hardness of modernist architecture. Edges can be places of creativity and boldness (Chapman, 2004). Wildness in this context challenges the expectations of place created by the order and control of the modernist aesthetic – it opens up slippery places of otherness, possibility, and creativity, creating a dialectic between nature and human activity (Brady, 2006) seen in participants' descriptions of how gazing at the green roof helped them to gain perspective and problem solve during their workday. This is a different design goal than to fit in well with existing buildings (Jungels et al., 2013), but appropriate for cities looking to entice urbanites to live downtown in areas lacking in greenspace. Design strategies to encourage this creativity and wildness might include vertical elements such as living walls, continued use of 'messy' or 'soft' vegetation such as grasses against the straight lines of buildings, different scales in the design, such as small flowers contrasted with larger shrubs, and the incorporation of artwork.

Third, the 'edginess' and ecological aesthetics of green roofs may fit Thompson's discussion of 'loose-fit places' and be a model for urban greening programmes in general, particularly if they are accessible. These are edge places, abandoned land, or wild spaces that were often explored during childhood and which invite unstructured play and possibility (Thompson, 2002). Importantly, unlike most of the modernist downtown landscapes of North American cities, these spaces are unconstrained and open to a multiplicity of uses and users. In this sense they parallel the freedom of childhood exploration, fascination, and wonder that participants so often reminisced about when talking about nature, and which Richard Louv and others have discussed as an integral part of a being human (Louv, 2006; Milligan & Bingley, 2007). However, wilder spaces are also sometimes viewed as unkempt, scary, and inhospitable (Nasar & Fisher, 1993; van den Berg & ter Heijne, 2005). Their juxtaposition with built form, and the knowledge that humans helped create them, may help to make this wildness more palatable and inviting for urbanites, a design strategy traditionally used in Japanese aesthetics (Saito, 2002b). Like Nassauer's Cues to Care concept, in which naturalized areas are more acceptable when accompanied by signs of human care and deliberate attention (Nassauer, 1995), a wilder aesthetic when combined with the straight lines of modern buildings may signal a new *urban* ecological aesthetic and a more reciprocal relationship between nature and the city. New York City's Highline, or Chicago's Lurie Gardens in Millennium Park, are great examples of introducing a 'wilder' ecological aesthetic to urban landscapes that also provide 'loose-fit' places for a multiplicity of uses and people. The Highline aims to re-create the abandoned-lot type of ecosystem on a disused rail line and includes spaces for walking, amphitheatre-type seating that makes the city a spectacle, and numerous places to sit quietly and read or watch passerby. Chicago's Lurie gardens, part of the large at-grade green roof Millennium Park, uses large swaths of similar prairie-style plants to create a look that is both stylized and wild and provides spaces for public and private seating. Both projects have been immensely successful and are exemplars of a new urban ecological aesthetic used to forward urban revitalization goals. Green roofs could model these successes by providing physical access where feasible and encouraging spaces for a multiplicity of users.

Lastly, there is the question of aesthetics and access. Participants who were far away from the roof could not see much detail, colour, or variation, and were astounded at the variety of the

green roof once they were closer. This raises interesting questions for green roofs since they are generally meadow-like or a variety of sedum species, and usually inaccessible: how could they be designed to provide this kind of experience while maintaining their ecological goals? New research in green roof design supports the promotion of plant diversity and the use of native and non-native plants, arguing this encourages greater coverage while reducing wind scour and increasing green roof resilience (Fusco, 2010; Lindemann-Matthies & Marty, 2013; Torrance et al., 2013). Lastly, the addition of small mounds planted with shrubs to provide wind protection and create microclimates (Fusco, 2010), combined with high-performing sedums species, can further ecological goals and add interest. Adding more colour and cues that the aesthetic is on purpose may also help to lessen the association of 'messy' nature with neglect and disease and increase their acceptance (Dunnett, 2006). Done carefully, this new ecological aesthetic may provide hope for both ecological and human urban health.

6. Conclusion

What can we learn about participants' experiences of green roofs, aesthetics, and urban nature in Toronto and Chicago? First, though green roofs are a new form of nature in cities, participant experiences of them are highly mediated by aesthetics, previous experiences of nature, and narratives about progress, modernity, and native habitat. In Chicago, this meant recognizing the city hall green roof as prairie-style, while in Toronto only participants familiar with the prairie recognized this. Such associations also carry cultural values with them. For Chicago, the remnants of prairie outside of Chicago evoked both the unconstrained explorations of childhood and wild beauty as well as neglect, messiness, and a resistance to the narrative of progress, control, and cultivation of the Midwest. For Toronto, many participants viewed real 'Nature' as up north, with forests and lakes, and while many found the prairie-style green roofs beautiful, they were not seen necessarily as 'Nature' – a place they retreat to. This has implications for the public acceptance and appreciation of both green roofs and urban greening projects in general. It also, if done carefully, may open up possibilities for re-connecting urbanites with the native habitat of their region.

This raises the second issue, which is the role of expectation of the daily-lived experience of downtown central business districts. Certainly control of nature, and a lack of places to eat lunch and take a break, can be read from the hardness of concrete, glass, and steel. The narrative is one of work and control, not comfort and rest. However, participants often spent eight to ten hours a day at work, and expressed the need for even a five minute mental break to help them be more productive and in a better head space at work. Given participant expressions of gratitude and hope over the placement of green roofs within visual or physical access of their workplace, placing green roofs or other small greening projects may signal care of the whole person, versus just the worker, and may start to change the lived experience of place in central business districts. This may be particularly relevant as many central business districts are experiencing booms in condominium construction and have people living in them for the first time in their history. These new residents will have different expectations of comfort, dwelling, and place than office workers.

Lastly, participant responses to green roofs raise the issue of access, scale, and distance which influenced participant perceptions of green roofs and the level of importance they had in their workday. The sensual aspect of nature, whether through touch, smell, sound or visual cues, is an important part of the human experience with nature. If only the visual aspect is available to office workers in central business districts, then perhaps urban greening projects can be designed to maximize interest, a sense of play, and exploration to mimic participant memories of childhood nature experiences. Combined with a more ecological aesthetic, and juxtaposed with the built form of central business districts, these urban greening projects may prove to be beneficial both ecologically and psychologically for the city and its workers.

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