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‘Nature makes people happy, that’s what it sort of means:’ children’s definitions and perceptions of nature in rural Northwestern Ontario

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\textbf{ABSTRACT}

Nature exposure positively impacts children’s physical, socio-emotional, and cognitive health and development. We know less about how children perceive their connection with nature and what nature means to them. This study uses focus groups to understand how rural Canadian children define, experience, and perceive benefits of nature. Using thematic analysis, we identified three primary themes. First, while children associate nature with specific activities, natural elements, and locations, they also conceptualize nature as ‘a whole community.’ Second, children experienced nature through doing, highlighting how activities connected them with nature while recognizing constraints on those engagements. Finally, children demonstrated agency in accessing nature to improve their emotional states. These findings indicate that from children’s views, nature is more than just space with natural elements. Children are also knowledgeable about the health benefits of nature, and capitalize on this knowledge. These findings can inform interventions to increase children’s interactions with outdoor environments.

\textbf{ARTICLE HISTORY}

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\textbf{KEYWORDS}

children; nature; focus groups; rural; health; qualitative

\textbf{Introduction}

Research shows that time spent in and exposed to nature, including views from indoors, positively impacts children’s physical, mental, emotional, social, and cognitive health and development (Wells\textsuperscript{2000}; Taylor and Kuo\textsuperscript{2006}; Amoly et al.\textsuperscript{2014}; Balseviciene et al.\textsuperscript{2014}; Hartig et al.\textsuperscript{2014}; Sanders et al.\textsuperscript{2015}; Ward et al.\textsuperscript{2016}; WHO\textsuperscript{2016}; Tillmann, Clark, and Gilliland\textsuperscript{2018a, 2018b}). Children’s diminishing access and time spent engaging with the natural environment has raised concerns about behavioral and socio-emotional problems associated with a lack of exposure to natural environments, sometimes conceptualized as ‘nature deficit disorder’ (NDD) (Kahn and Kellert\textsuperscript{2003}; Louv\textsuperscript{2005}; Taylor and Kuo\textsuperscript{2006}; Driessnack\textsuperscript{2009}). To develop solutions that encourage children to connect with nature and mitigate the negative impacts associated with increased time indoors (e.g. being sedentary, viewing screens), we need to understand how children perceive nature. The relationship between (un)healthy behaviors and time spent in nature is far more complex and requires an investigation into how children define, experience, and perceive nature. Quantitative assessments of accessibility to nature are limited in that mere geographic access or opportunity does not necessarily translate into use of these environments (Bell et al.\textsuperscript{2014}).
Despite a wealth of research on children’s direct and indirect contact with nature, particularly in relation to home and school environments, little work has considered how children perceive their connection with nature and what nature means to them. Moreover, to date, most of the qualitative research that has been undertaken has focused on children in cities. Less is known about how children from rural and remote settings perceive and experience nature in their environments (Nykiforuk et al. 2018). In this article, we explore how children living in rural Northwestern Ontario, Canada define nature, experience nature, and perceive the benefits of nature. Our goal is to generate evidence rooted in children’s experiences to inform interventions to foster interactions with nature that improve children’s health and developmental outcomes.

**Children’s views of nature**

The bulk of the research on children’s perspectives on nature has focused on children’s pro-environmental behaviors or environmental stewardship (Schultz 2000; Cheng and Monroe 2012; Mustapa, Maliki, and Hamzah 2015). Other studies have used quantitative measures and tools, such as the Children’s Environmental Perception Scale or Connectedness to Nature Scale (CNS), to assess children’s perspectives on nature (Mayer and Frantz 2004; Larson, Green, and Castleberry 2011). Of the qualitative studies that have been undertaken on children’s perceptions, attitudes, feelings, and behaviors towards nature, most have focused on urban environments (Aaron and Witt 2011; Freeman et al. 2015; Lekies, Yost, and Rode 2015). For example, Aaron and Witt (2011) used interviews and drawings to investigate urban minority children’s definitions and perceptions of nature in Houston, Texas and found that children possessed varying degrees of awareness about nature. This variation in awareness was based on the children’s exposure to natural environments. Similarly, a study by McAllister, Lewis, and Murphy (2012) in Waterloo, Ontario found that urban children had mixed feelings and minimal contact with the natural environment. Our work extends this literature to children’s experiences with nature in a rural setting.

Urban children are often seen to be at a greater disadvantage when it comes to accessing nature, including living further from dense natural spaces (i.e. forests or wilderness), having larger city centers with little green space, as well as diminishing pro-nature attitudes furthering their declining access (Simmons 1994; Schultz 2000; Louv 2005; Aaron and Witt 2011; McAllister, Lewis, and Murphy 2012; Freeman et al. 2015). Although children’s connections with and understandings of nature are influenced by where they live (Louv 2005; McKendrick 2014), little research has considered how variation or changes in urbanicity/rurality may affect these perceptions. Few studies have compared rural and urban children to see whether and how their perceptions, feelings, and definitions differ (Lekies, Yost, and Rode 2015). It is important to recognize children’s agency, and potentially context-specific constraints, within and across a range of urbanicities.

Historically, geography as a discipline has largely ignored how children’s lives, experiences, attitudes, and opportunities are socially and spatially structured, focusing on adult experiences even when research questions are relevant to both populations (James 1990; Holloway 2014). However, children interpret and experience their environments in fundamentally different ways than adults, making research on adults inapplicable to child populations (James 1990; Barker and Weller 2003; Hyun 2005). For example, children may use a park for play, while adults may use the space as an opportunity for ‘working out’. Current acknowledgement of children in the design of spaces is generally limited to schools and playgrounds – although, we know these are not the only spaces children use and experience in their habitual environments (James 1990; Holloway 2014). Nature is an example of an environment that children and adults may engage in different ways. In this study, we adopt a child-centered methodology that aims to move past describing children’s environments, to construct an account of children’s perceptions and experiences of their environments. We do this by investigating how children living in a rural Canadian community define, experience, and perceive the benefits of nature.
Methods

Methodological approach

Our research design is informed by child-centered principles in that we take the epistemological stance that research should be with children, not just on or for children (Matthews 1998; Mason and Watson 2014). Our methodological approach thus employs qualitative methods that aim to respect and value children’s voices rather than assuming that adults ‘know best’ (Morgan et al. 2002). Coupled with our child-centered methods, we took an insider approach, whereby the moderator of our focus groups was a young adult man who was born, raised, and worked in the local communities as an educator. This was crucial so that our data collection and analyses were grounded in knowledge of the local socio-cultural context of nature. We use focus groups as a way to address some of the challenges characterizing traditional methods (e.g. surveys) in research with children, such as perpetuating unequal power relationships or children perceiving participation as intimidating or boring (Punch 2002; Barker and Weller 2003). Focus groups present a more conversational setting where children may communicate without literacy barriers to facilitate speaking about their understandings and experiences. The purpose of a focus group, as defined by Krueger and Casey (2000), is to obtain perceptions on a defined area of interest in a permissive, non-threatening environment. Furthermore, consensus is not the goal of a focus group; rather it is to develop a data corpus that holds the perceptions, attitudes, beliefs, motivations, concerns, and opinions of a targeted group of interest (Krueger and Casey 2000). The permissive atmosphere of a focus group can allow participants to share more openly as well as be influenced by others just as they would be in an everyday situation (Krueger and Casey 2000). All of these methodological features make focus groups an optimal technique for addressing our objectives related to children’s perceptions of nature.

Focus groups with children require consideration of particular sets of power relationships, while acknowledging that power asymmetries can never be eliminated from any type of child-centered approach (Barker and Weller 2003). In our study, the moderator invariably possessed a level of authority over the participants, especially in a school setting, where all of the focus groups took place. While having a moderator from the community who was attuned to the local context was beneficial for creating a comfortable focus group environment, we also recognize that having a moderator from close-to-home can influence how and what children choose to share. The school setting also had the potential to influence children’s responses; for example, in focus group discussions some students specifically referenced ‘out there’, pointing out the window of the focus group room. In addition, school is a context where children are disciplined and subject to adult authority, which may layer particular power dynamics into our research relationships. The group setting of 3–7 participants also could have contributed to participants agreeing with each other more, in order to stay socially relevant; peer dynamics and social hierarchies may have played a role in how children engaged in the discussion (Morgan et al. 2002). Remaining cognizant of these dynamics, we engaged focus groups as a way to foster a conversational and informal dialogue that allowed children to drive the conversation within our topical framework.

Data collection

Data for this research were collected in 2016 from students from four elementary schools in Northwestern Ontario, encompassing three rural townships on the far North shore of Lake Superior, ranging in size from approximately 300–1600 inhabitants (Statistics Canada 2017). The region is home to white Canadians and a population who identifies with the Aboriginal Peoples of Canada, as well as a small immigrant minority (Statistics Canada 2017). The region is surrounded by dense boreal forest including species such as black and white spruce, jackpine, cedar, and white birch. Children can easily access a variety of natural environments including rivers, small and large lakes, forests, parks, wilderness, and a variety of terrains and mountains with a maximum elevation of \(\sim 530 \) m. The schoolyards that participants play in, range in size and features. All four schools have playground
structures with open grassy areas but some yards back onto forest and cliffs, while others are within the small towns and surrounded by houses. Two schools have a baseball diamond and a few trees scattered in the yard. The other two have no trees where children play on school property and are simply grass with a small paved area for basketball and other games. Hunting, and to a lesser extent fishing, are very much a part of the local culture, where boys and girls participate regularly on weekends with their families.

Ethics approval was granted by the Non-Medical Research Ethics Board of the University of Western Ontario (NM-REB #:108029). After securing study approval from local school boards and principals of the participating schools, our research team posted a letter of information about our study to parents at each school through the school’s official Facebook page. Members of our team then made presentations at each school to all grade 4–8 students present on that day to fully explain what was involved in the study and to answer any immediate questions. After the presentation, children received a package to take home to their parents. To be eligible to participate, signed parent consent and child assent forms were required, including obtaining consent to audio record and transcribe verbatim all focus group material. All participants were aware that anonymous direct quotes could be used for the purpose of this research. Any child in grades 4 through 8 who was interested and had parent consent was eligible to participate. The four regional elementary schools contained a total of 194 students from grades 4–8 inclusive, of which 136 participated in the larger research of which this project is a part and 84 participated in the focus group component reported here (43.3% of all grade 4–8 students). Twenty focus groups were conducted across the four elementary schools during lunch hour through fall/winter 2016, with 3–7 participants per group. All participants self-identified as boys or girls; no gender-diverse identities were reported. Half of our participants identified as solely white/Caucasian, while about a third identified as North American Indian, Inuit, Métis (see Table 1).

A semi-structured focus group guide focused discussions on children’s physical activity habits, neighborhoods, eating behaviors, and understandings of nature. The questions about nature were designed to align with our objectives to understand children’s definitions, experiences, and perspectives of the benefits of nature (i.e. what comes to mind when you think about nature? where do you find nature at school? what do you use nature for at home?). For the purpose of this paper, only the questions regarding nature were analyzed; these portions of the data represented approximately 12–

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15 min of each focus group transcript. The focus group protocol followed an outline for discussion, but was flexible to allow the participants to drive the conversation. The moderator did, however, ensure that groups stayed on topic by using prompts to return to the original question. Each focus group lasted 30–45 min and was facilitated by the same researcher. All focus groups were audio recorded, transcribed verbatim, and double-checked for accuracy to ensure trustworthy data.

**Analysis**

We employed thematic analysis to identify patterns within the data set (Braun and Clarke 2006). We used a combination of deductive and inductive coding in that we took a deductive approach at the outset to develop a categorical organizing framework for the analysis (definitions, experiences, benefits). Within these three categories we then undertook detailed inductive coding, or a bottom up, data-driven approach. We followed Braun and Clarke’s (2006) systematic process for thematic analysis which includes becoming familiar with the data, generating initial codes, searching for and reviewing themes, and defining and naming themes. First, using NVIVO Pro (Version 11), we reviewed the transcripts and assigned text to each of the three components of our organizational structure so that our data set that aligned with our study objectives (definitions, experiences, benefits). Then, across the data set, we used open coding to inductively identify the specific dimensions of children’s definitions and experiences of nature, as well as their perceptions of the benefits of nature.

We integrated several checks for rigor in our analysis. For one, the original moderator also acted as a second coder, reviewing the initial and final codes, to ensure significant content was not missed by the primary analyst (Baxter and Eyles 1997). We also employed what Smith and McGannon (2017) identify as ‘critical friends’, where discussion with a colleague is employed to interrogate the original thinking about the data and foster reflexivity, while not necessarily attaining agreement. Finally, we also extended critical reflexivity into our analysis by considering how our positionality shaped the interpretation of the data. Recognizing that we are adult researchers assigning meaning to children’s words, we aimed to align with child-centered principles throughout our analysis by, for example, using children’s own words as much as possible to explain concepts.

**Results**

‘It’s like a whole community:’ defining nature

Many participants described nature as being the sum of many parts. Definitions of nature often centered on specific natural elements, such as ‘wood and stuff and there’s trees and grass everywhere’ (boy, age 10) or ‘I think of bears’ (girl, age 11). Yet, when probed as to why they considered particular natural elements to be nature, most children located these components as part of a wider system, as one twelve-year-old boy put it, because ‘nature is an environment, it’s a whole, like, community’ (boy, age 12). Others focused on the links between these natural features as being ‘cause they’re outside’ (girl, age 13). Children also emphasized the connectivity between particular natural elements in terms of the living qualities of the natural environment. A nine-year-old girl explained this as, ‘Because it still has the roots and it has the soil that has it outside and the dirt and all of the other things that make a plant grow and it has – you can put water on it like the trees outside with the rain’. This emphasis on the connections between living elements was clear when students were asked if they considered a plant in a classroom to be nature, and about a third of the students disagreed, with comments like: ‘nature is like a bunch of stuff. It is not just one thing in a place where it’s not supposed to be’ (girl, age 12). This builds on the idea of nature as a whole community or the sum of many parts. At the same time, however, about half of participants agreed that a plant in the classroom was nature, as one student said, ‘because it is still a living thing. Like, it is kind of like if you have humans and you put them in the bush, they’re still humans’ (boy, age 12). Other children were
unsure. The seeming tension between viewing nature as a whole and classifying a classroom plant as nature may reflect the emphasis on specific natural elements in many children’s definitions of nature.

While children saw nature as a system of living elements, this often excluded humans. Participants described ‘untouched’ versions of the natural environment as being an important component of their definitions of nature. Not a single participant mentioned parks when asked about where they find nature – a point which may also reflect the very few purpose-built parks in their communities. Nature was more commonly addressed as ‘the bush’ or by individual natural elements such as ‘big leaves and in the bush’ (boy, age 11) and ‘trees and forests and bushes and animals roaming around’ (girl, age 13).2 When people were mentioned, this was primarily describing anthropogenic effects on the environment, which were mentioned by a few participants:

if people, like, carpool more often it’s not really hurting the environment ‘cause so—because if you don’t carpool then there will be more vehicles polluting our nature and then the environment and so it will, like, like kill animals and grass and everything that’s nature. (boy, age 11)

Rather, children spoke of places with idealized, positive qualities, without necessarily tying them to specific location – which speaks to a broader definition of nature that could be ‘anywhere.’ The word ‘place’ itself was frequently used by participants when defining nature. For example, one student saw nature as a ‘beautiful place where you can hunt and fish and lots of good sites and smells’ (boy, age 10), while another framed nature as ‘carefree place for animals and people to be alike’ (boy, age 11).

Participants also identified nature as being in set locations including home, their neighborhoods, and specific areas of their communities. Nature around the home was most often considered what was outside, such as ‘in front of my house and behind my house’ (girl, age 10); however, one participant did identify nature as being ‘also inside my house cause my mum really likes planting’ (boy, age 11). Responses also included specific locations in participants’ surrounding neighborhood, not just on their home property: ‘when we hike at the Bald Spot’ (boy, age 11) and ‘everywhere … we’re surrounded by nature’ (girl, age 12). In contrast participants often did not readily observe nature as being on school property, remarking that there was ‘not too much nature’ (boy, age 13) and ‘behind the fence’ (multiple students, explaining that nature lays beyond the school fence). The nature that they did describe at school often took the form of discrete natural elements, for example grass or trees, as opposed to home or their neighborhood where they described detailed accounts of a particular place. The lack of detail in the descriptions of nature at school points to how children’s views of nature can vary significantly between one location and another. The detail described in defining nature around home in comparison to at school emphasizes the disconnect between nature and school environments.

Many participants considered their home environments to be located in nature, as expressed clearly by one participant: ‘there is nature all around my house because I kind of live in the bush’ (girl, age 10) or ‘everywhere … we’re surrounded by nature’ (girl, age 12). This was also evident when participants referred to nature specific to where they lived: ‘nature here is pretty good’ (boy, age 13) and ‘trees, mountains, and at my dad’s house we just have a lot of bushes’ (girl, age 9). Although participants lived in a rural environment some were able to identify places outside their habitual environments as nature: ‘[a big city] that’s still nature’ (boy, age 10). There was some disagreement over this but participants who discussed it argued that nature could be found anywhere.

*I usually think of the lake ‘cause I swim:* experiencing nature

Children frequently identified outdoor activities in their definitions of nature, often describing nature through their experiences participating in specific activities. As one thirteen-year-old boy explained:

For me, uh, I usually think of the lake ‘cause I swim across it a couple of times and when you go to the other side it’s, like, just everything you imagine nature to be, like, there’s trees, there’s, like, moss, there’s, like, bugs. We found a toad there one time, um, and there’s, like, rocks to jump into the water, like, it’s just, it’s pretty cool.
This quote demonstrates how children’s specific activities in nature can be a gateway into other more open-ended engagements with nature. Other responses, however, demonstrate highly specific ways of engaging with nature, citing activities like playing, building forts, walking, hiking, hunting, camping, gardening, skating, ‘quading’, and swimming, as one eleven-year-old girl said, ‘in the summer I’m either quading or on the trike’. \(^3\) Several activities specific to the region were common responses, with participants echoing comments similar to ‘I usually think of, like, hunting and other outdoor activities like that’ (boy, age 13). Children enumerated a range of activities that reflected various ways to engage nature with play, including hunting, fishing, swimming, playing outside, climbing, exploring, building forts, running, walking, and games. Notably, very few activities with defined rules or ways of playing or sports were mentioned as being a part of nature. Unstructured, free play, or ‘made-up’ activities were more common in children’s responses, such as, ‘Twig jumping. I put twigs far away and try and jump on them’ (boy, age 9). Activities around home and school often overlapped, with school activities including basic forms of play as well as unstructured sports. However, responses associated with the home environment were much more diverse and complex, as they encompassed more unique options and terrain:

I take a nice walking trail and yeah, I just walk up there and bring my dog to get exercise and there’s actually two trails you can take the long way it’s a little bit more easier or you can take the one that goes straight up the trail but I go on, like, the long way with my dog because my dog’s a little ‘scaredy’ cat. (boy, age 13)

Technology, parenting styles, and seasonality were all factors children identified as influencing and mediating their experiences and engagements with nature outside of school. With regard to technology, many children felt that nature ‘gets you away from electronics’ (girl, age 12). Some children emphasized scenarios where they were alone ‘when I’m in nature, if I’m, like, by myself on, like, and it’s nice, like, I feel like, like, kinda, like, relieved of stuff’ (girl, age 13) or with peers ‘playing with friends’ (boy, age 9). Others were keenly aware that rules set out by their parents could limit their access to and time spent in nature, pointing out that ‘I play in the nature all the time, once my parents get home’ (girl, age 10) or ‘Yeah, I can’t go in the trees. My mom says it’s too far from the house when it is just in the backyard’ (girl, age 8).

Finally, seasonality shaped children’s experience with nature, as many participants discussed summer weather supporting their engagement with nature saying that ‘I prefer, like, summer better’ (boy, age 13) and:

in summer, it’s really nice ‘cause you can just walk around, you can enjoy the breeze, you can feel the sun, you can climb trees and stuff like that. In winter, it’s a little bit different, it’s hard to walk, you get full of snow, it’s cold and, like, trees are dead, everything just looks dead in winter. (boy, age 13)

Despite the challenges of winter, a number of children discussed activities and aspects of the winter season that drew them to nature, noting that ‘makes me feel happy because in the winter it’s all like white and glistening and it’s pretty pretty actually, its pretty beautiful actually’ (boy, age 10) and ‘I love when its winter ‘cause it builds up into like a giant hill’ (boy, age 9).

Participants also identified important differences in the ways they experienced nature within and outside of school. A number of students described feeling ‘normally not allowed’ (girl, age 12) to use nature at school, or ‘sometimes, but not very often, only when we’re doing something about nature like if we’re planting trees then we’re allowed’ (boy, age 12). Indeed, reflected in the latter quote, many students associated school work, such as ‘a science project’ (girl, age 9), or activities with their class as another way they engage with nature at school. Activities at school included hanging out, talking with friends, playing games, and walking: ‘[Friends name] and my other friends usually go there to talk about what we’re gonna do after school’ (girl, age 10). In line with the definitions of nature above, only a handful of participants, mostly boys, mentioned structured outdoor activities that do not necessarily involve directly engaging with nature, like, ‘Football, or, like, soccer’ (boy, age 11).
‘Where you can just express your mind:’ perceived benefits of nature

Children also recognized opportunities for physical activity in these nature activities, citing how they valued nature ‘to get exercise’ (boy, age 12; girls, ages 8 and 13) and because ‘it’s good because you get fresh air, and you get active’ (girl, age 10) and ‘fit’ (girl, age 10) and ‘makes you energized’ (girl, age 11). They also demonstrated awareness that being in nature promoted less sedentary lifestyles, as one thirteen-year-old girl commented, ‘we do it for, to get exercise.’

While children spoke about some of the widely understood benefits, like exercise, which mostly encompass the physical health benefits, they also were well aware of the emotional or mental health benefits associated with nature exposure and engagement. Children exhibited a great deal of agency in actively using nature to facilitate positive feelings. For example, children were direct about engaging in nature because ‘it makes me feel calmer cause its quiet’ (boy, age 11) and ‘I feel relaxed’ (girl, age 10) and ‘it makes me feel healthy’ (boy, age 9). These responses demonstrate the restorative effects that young people attributed to nature and their awareness of nature’s ability to modify their feeling states. Participants also used nature as a place where they could be free from restraints experienced in other contexts, as one nine-year-old girl noted, ‘it’s where you can just express your mind’ (girl, age 9). Children were quite clear nature could positively modify their feelings, as one twelve-year-old boy said, ‘if you and your brother are fighting and you just go outside, you feel better.’ This highlights how some children perceived nature to provide relief from everyday stresses. One eleven-year-old boy summed this up as, ‘Nature makes people happy, that’s what it sort of means.’ Of note, the term ‘mental health’ was never used by the moderator or mentioned by participants; however, it is clear from children’s perspectives that nature performed several mental health-promoting functions, including ‘it relieves stress. It’s nice to get out of town and have, and be able to quit worrying about stuff’ (girl, age 13) and ‘If I’m having a bad day, then, like, maybe I’ll go outside and feel better’ (girl, age 11) and ‘It makes kids feel good about themselves and happy’ (girl, age 9).

Some children were also clear about nature as beneficial to their cognitive functioning, with one twelve-year-old girl noting ‘it makes my brain work on things that I think about’ (girl, age 12). At the same time, some children also identified modifying factors affecting their emotional experiences in nature, such as seasonality. A thirteen-year-old boy observed that, ‘I kind of feel better but, like, it kind of depends on, like, what the environment’s like’ (boy, age 13).

Many children also drew attention to how they felt ‘in-place’ in nature, with comments such as ‘I feel like I belong there’ (boy, age 12) and ‘Like when I’m there no one can stop me from doing anything because yeah … it’s like it kind of makes me another world and I like own it’ (girl, age 12). These emotional connections illustrate how nature can be a context where children feel they have standing or a sense of ownership they may not experience elsewhere, where they are subject to certain power dynamics, such as at school or home. As such, many children described experiencing a ‘sense of freedom’ (girl, age 12) in nature, reflecting that ‘It makes me feel wild … I can do anything I want’ (girl, age 8) and ‘[nature] makes me feel powerful’ (boy, age 12). This was underscored by how participants used positive and affirmative language to describe their experiences in nature as ‘beautiful,’ ‘cool,’ and ‘peaceful.’ Some participants even described feeling ‘thankful’ and appreciative of what they perceived nature to provide, with one student reflecting on ‘how kind of lucky I am I have that spot’ (boy, age 9). Tied to these emotional connections, some children also spoke of being protective of nature: ‘I think that nature’s a really good beauty but we need to treat it better than we already have’ (boy, age 11) and ‘it should be respected more and not as much littering’ (girl, age 10). For other children, social connection with peers through nature was important, as one nine-year-old girl explained, ‘I usually go with friends there and hang out there. Because it’s a nice quiet place for people to hang out, talk for a little bit, so I usually go there with my friends and we talk.’

Participants did also identify negative feelings associated with nature, but were almost exclusively linked to feeling unsafe, scared, or nervous because of animals (bears) or inclement weather: ‘Kind of safe and kind of not because I am with people but there are a lot of animals’ (girl, age 8) and ‘scared,
‘cause you know, bears’ (girl, age 10) and ‘I also feel nervous because of scary animals and storms and stuff’ (girl, age 10). Although there were many responses from girls about feeling safe in nature, the large majority of responses about feeling unsafe due to animals came from girls. While some children also mentioned feeling ‘kind of lonely’ (boy, age 12), there was no mention of fears of strangers.

**Discussion and conclusions**

The purpose of this study was to explore rural children’s definitions, experiences, and perceived benefits of nature. Children’s definitions of nature were largely based on their habitual environments using natural elements and the idea of place as descriptors for often complex and detailed definitions. Experiences in nature were often discussed through doing, describing various structured and unstructured activities, limitations on these activities, and differences between home and school. Finally, responses describing the perceived benefits of nature all included some aspect of health, most notably emotional advantages of being in nature. Based on the findings, we argue that we need to extend the work on exploring children’s definitions and perceptions of nature in the current literature to actually consider what children themselves see as the benefits of interacting with nature.

This reconceptualization of the benefits of nature to include children’s perspectives strengthens current literature by foregrounding children’s agency in the reasoning behind why we see nature as beneficial to health. Rural children in our study were knowledgeable about the benefits of nature for their socio-emotional wellbeing at an individual level, and were agentic in capitalizing on this knowledge. Thus, it was clear that children make conscious choices to engage with nature in order to reap the benefits they identify. Children demonstrated a sophisticated understanding of nature as a ‘whole community’ grounded in the natural elements of their local environments and experienced through specific activities. These findings indicate that from children’s views, nature is more than just space with natural elements; it comprises complex features and landscapes. These findings help to move towards using children’s knowledge to facilitate the design of interventions that fit with what they see as the major benefits of interacting with nature.

The results of this study are consistent with those of similar studies in that, regardless of level of urbanization, children’s understandings of nature are predominantly mediated by their habitual environments and interaction with nature. Like studies of urban children, our study showed positive perceptions of nature linked to happiness, adventure, relaxation, and freedom (Simmons 1994; Bonnett and Williams 1998; Aaron and Witt 2011; Burgess and Mayer-Smith 2011; Lekies, Yost, and Rode 2015). These findings support the notion that increased prevalence of NDD is not necessarily tied to any growing dislike for nature, but rather a variety of behavioral and environmental factors (Louv 2005; Driessnack 2009). While studies with urban children associate nature with danger from animals, strangers, fear, and uncleanliness (Simmons 1994; Wals 1994; Emmons 1997; Keliher 1997; Wilhelm and Schneider 2005; Aaron and Witt 2011; Burgess and Mayer-Smith 2011), our study showed that dislike or fear of nature was not a salient experience for these rural children (McAllister, Lewis, and Murphy 2012; Adams and Savahl 2015). Likewise, contrary to findings on urban children (Aaron and Witt 2011), fear of strangers was never mentioned by the rural children we spoke with. Another point of contrast is findings that urban children rate wilderness as their lowest preferred place and hold negative feelings of the natural environment, in particular ‘wild’ nature (McAllister, Lewis, and Murphy 2012).

Many children did not believe they could find nature at school, as their definitions of nature were more complex than what they could find at school. This was emphasized by participants’ definitions of nature as a whole community or the sum of many parts, which may not allow for such a confined space like a schoolyard to be considered. Rural children’s definitions of nature largely focused on complex forms of nature around the home environment. In comparison, in a study done by Simmons (1994) the school site settings were the most preferred grouping of nature photographs for urban children (Simmons 1994). This difference in preference may be attributed to rural children’s opportunity to access more complex nature, and therefore why their responses regarding nature
around home included many more examples. These findings have significant implications for the future design and implementation of infrastructure on school grounds, such as creating naturalized unstructured playgrounds using more ‘untouched’ forms of nature, including logs or slabs of rock.

Our findings also demonstrate that children’s knowledge goes beyond their ability to define nature, to understanding its benefits to their wellbeing. Very few studies have explored what children understand as potential benefits of interacting with nature. Perceptions, attitudes, definitions, and environmental stewardship of nature are the most common variables explored using the theme of nature in the literature (Emmons 1997; Schultz 2000; Cheng and Monroe 2012; Freeman et al. 2015; Mustapa, Maliki, and Hamzah 2015). The physical, mental, social, and cognitive benefits identified by participants highlight the in-depth understanding participants have of their own well-being, as well as in relation to nature. It is important to highlight the weight of the discussion that focused on the emotional benefits, participants were aware of exercise and other physical health benefits of interacting with nature, but they really focused on the benefits to their emotional health. This was established through the detailed descriptions of how it makes them feel and act. They understand nature as having the capacity to influence the way they feel and their behaviors. Their indirect descriptions of benefits, through discussions of stress, self-esteem, and emotional well-being are evidence of the awareness children have of themselves and others.

Although rural children tend to have greater access to nature in their habitual environments, it is important to develop school grounds that children perceive as having large amounts of nature due to the specific portion of outdoor time that happens during school hours. Interestingly, the majority of children in the current study did not define their schoolyards as being very natural places. Research has shown that green schoolyards have many benefits to academic achievement, focusing in a classroom, reduced stress, emotional well-being, relationship skills, self-management, and physical activity levels (Bell and Dyment 2008; Roe and Aspinall 2011; Williams and Scott Dixon 2013; Chawla et al. 2014; Barton et al. 2015; Wells et al. 2015; Tillmann, Clark, and Gilliland 2018a). The potential exposure to more complex forms of nature in a schoolyard setting is supported by acknowledgment of the numerous health benefits described by participants when engaging with nature. Furthermore, our responses from children as to whether a plant in a classroom constitutes nature were mixed, which demonstrates the need to assess whether there is value prioritizing nature interventions indoors or if these efforts are better allocated elsewhere outdoors.

With regards to limitations, this study is highly context specific to the geographical location of the participants characterized by the particular regional landscape, biodiversity, and socio-cultural context of Northwestern Ontario. More research is needed into children’s experiences in nature in other types of rural and remote environments. While our intention was not to examine socio-cultural differences in children’s experiences with nature, future research in rural and Northern Canada should take up an Indigenous lens to delve more deeply into the experiences of Indigenous children and youth. On a methodological note, although participatory principles were used to guide the methodology of the study, a fully participatory research design was not used due to the constraints of working within the school environment and timelines.

The methodological approach we have taken to privilege children’s first hand experiences with nature is important because it allows conclusions to be drawn about how children’s environments affect them. It is clear from these findings that children have the ability to be independent social actors capable of participating in discussions of their environments. Practitioners need to take advantage of the complex knowledge that children possess to facilitate the use of nature as a tool for health-promotion (Pretty et al. 2009). If children view nature as being beneficial to their health on their own terms, they are likely to respond more positively to encouragement of interacting with nature. There has been some encouragement from practitioners to incorporate nature as a tool to better health (Driessnack 2009), but there is a need for it to become mainstream throughout a variety of practices. Policy makers also need to consult with children over the development of policies that affect them (Barker and Weller 2003). Rural communities are known to have less access to health-promoting infrastructure, such as recreation centers or bike lanes, and resources, including
physicians, specialists, programs, services and technology (Boehmer et al. 2006; Smith, Humphreys, and Wilson 2008; White 2013). On the other hand, rural environments have greater access to nature compared to their urban and suburban counterparts (Aaron and Witt 2011). Therefore, the results of this study support policy and programs targeted towards nature being incorporated as an effective tool to promote and make changes in children’s overall health including their physical and socio-emotional wellbeing. Given that perceptions of nature are most strongly developed between ages seven and eleven, with these perceptions sustaining into adulthood, our findings support the need for ongoing promotion of nature to children (Cheng and Monroe 2012).

Notes

1. The purpose of this step was to inform parents about the project before their children, to provide them the option of blocking their child from hearing about the project before they themselves got to hear about the project, as to comply with the university’s ethics board request.
2. Based on local knowledge of the focus group moderator, ‘the bush’ was used to describe areas of the natural environment where people hunt, or what may be more commonly referred to as a ‘forest’.
3. Quads and trikes are colloquial names for motorized 4-wheel and 3-wheel all terrain vehicles, respectively.

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