

# International Journal of Early Childhood Environmental Education

Addressing Policy, Practice, and Research That Matters

Yash Bhagwanji, Editor

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## Fostering Empathy for People and Animals: An Evaluation of Lake Superior Zoo's Nature Preschool

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### ABSTRACT

In light of the significance of empathy in prosocial and conservation behavioral contexts, and with its relevance to social-emotional learning, which is an emphasis in early childhood education, empathy is a timely and meaningful construct to study within the context of nature preschools. Thus, a program evaluation was conducted to explore the potential of a nature preschool, and specifically a zoo-based nature-preschool, to foster children's empathy. This was a small-scale evaluation, conducted with 10 preschool participants. Yet it suggests the potential for supporting children's empathy through a zoo-based nature preschool, as data indicates children's emotional sharing and empathic concern significantly increased across the three contexts of with humans, non-wildlife animals, and wildlife. Cognitive perspective-taking significantly increased in the context of humans, but not in animal contexts. Implications for further research are discussed.

**Keywords:** nature play, nature preschool, empathy

Empathy is the understanding and sharing of others' feelings (Knafo-Noam et al., 2009). It is also described as an affective response that stems from the comprehension of another person's emotional state or condition (Eisenberg & Fabes, 1998). Empathy is at the heart of what it means to be human, as it is a foundation for ethical and humane actions, good relationships, and academic and professional success (MCC, 2018). It is surfacing as significant in conservation contexts as well. A network of zoos and aquariums, *Advancing Conservation through Empathy (ACE) for Wildlife* facilitated by Woodland Park Zoo (Seattle, Washington, USA), is leading efforts to learn how empathy for wildlife in zoos and aquariums can be a catalyst for conservation action for wildlife, ecosystems, and the planet. Within the zoo and aquarium community, empathy is defined as a stimulated emotional state that relies on the ability to perceive, understand, and care about the experiences or perspectives of another person or animal (Wharton, Khalil, Fyfe & Young, 2019).

### Components of Empathy

Empathy includes both cognitive and affective cognitive components (see Figure 1). *Cognitive empathy* is the ability to understand what another is feeling or thinking, without necessarily feeling those feelings or thinking those thoughts (Spreng et al., 2009). Cognitive empathy includes *feelings identification*, which is the ability to perceive cues from another and understand what that person is feeling and thinking, and *perspective-taking*, the ability to consciously place oneself in the mind of another and imagine what that person is thinking or feeling ("putting yourself in another's shoes") (Cuff et al., 2014).

*Affective empathy* is an instinctive ability to sense, feel, or experience the perceived emotions of another person (Cuff et al., 2016). The affective domain of empathy includes *emotional sharing* and *empathic concern*. Emotional sharing (also called emotional empathy or emotional contagion), is sensing or experiencing the perceived emotions of another, and empathic concern (also called motivational empathy or compassionate concern), is the motivation to care. Emotional sharing may lead to empathic concern with further cognitive processing of the other person's state (Eisenberg, 2000) and with the contribution of emotion regulation skills (Hay, 2009).

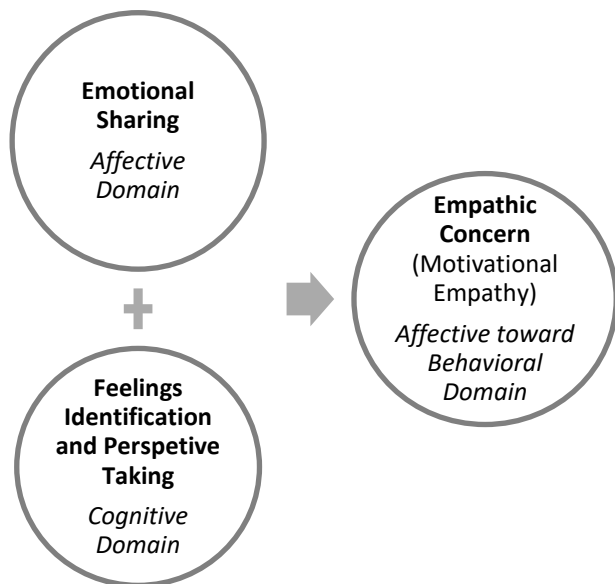


Figure 1: Relationship among Affective and Cognitive Dimensions of Empathy

### Developing Empathy

Early childhood is an important period of empathy development. During the first few months of life, a foundation for empathy is built through a secure and loving relationship with the caregiver. Around 6 months of age, babies exhibit social referencing, where they “read” and use caregivers’ responses to regulate their responses toward other people, situations, or objects. As they begin to associate emotions with words and expressions, babies during their first year begin imitating others’ emotions and expressions (Knafo-Noam et al., 2009). Around 18 to 24 months of age, toddlers understand themselves as separate persons (Knafo-Noam et al., 2009) and are growing in their ability to recognize their own emotions, show an understanding of the emotions of others, and respond to emotional cues by expressing verbal or facial interest in and even concern over another’s distress (Zahn-Waxler et al., 1992). Many toddlers can engage in helping behaviors in response to real or simulated distress by age two, moving from primarily physical helping behaviors to a wider variety of helping behaviors such as verbal comfort, distracting the person in distress, and even advice (Zahn-Waxler et al., 1992). Children’s cognitive empathy increases significantly during the preschool years, with their growing abilities to use words to express emotions and as they more accurately recognize, understand, anticipate, and respond to the emotional expressions of others (Knafo-Noam et al., 2009). By the time children are four or five, they usually can see a situation from the perspective of another, which is necessary for viewing the situation of another more accurately and responding with more effective helping strategies (Wellman et al., 2001).

In neuroscience literature, and as described earlier, empathy has affective (sharing others' emotions) and cognitive (understanding others' emotions) components (Mackes et al., 2018). Affective empathy is linked to mirror neurons that allow an individual to observe another person and respond to the stimuli similarly, thus providing a neural basis

for empathy (Goldman, 2014). Most people and even many animals have this capacity, although some biological conditions affect how well mirror neurons function and grow (Gerdes et al., 2013). Cognitive empathy is also based in mirror neurons, but unlike affective empathy, it is considered intentional, controllable, and teachable (Carr et al., 2003). Since the affective and cognitive components involve partially non-overlapping brain regions (Mackes et al., 2018), and as the brain systems relevant to the affective aspects of empathy develop earlier than those relevant to the cognitive aspects of empathy (Malti et al., 2016), there is the differential developmental pattern. Affective empathy appears very early on, with a slight increase during the first three years, and remains relatively stable across the lifespan (Davidov et al., 2013). Cognitive empathy gradually increases from early to late childhood. This coincides with the intertwining of empathy and social-cognitive development, as well as emotion regulation skills, both of which increase from infancy to adolescence (Hoffman, 2000). In particular, changes from external to internal sources of regulation as children grow, along with the developing regulatory capacities of effortful control, delay of gratification, and attentional control, also promote increasing empathic capacities during the childhood years (Eisenberg & Eggum, 2009).

### **Strategies to Foster Empathy with People and Animals**

While empathy is strongly influenced by neural development, it is also influenced by genetics and temperament (Zahn-Waxler et al., 1992), as well as socialization and developmentally responsive strategies and supports (Goldman, 2014). In other words, children are born with the capacity for empathy, yet empathy can and should be nurtured throughout their lives. The literature on empathy offers many research-based strategies for nurturing empathy, including providing young children with warm, positive environments (Zhou et al., 2002) and fostering secure attachment relationships with caregivers (Kestenbaum & Sroufe, 1989). This helps children know they are emotionally and physically supported, which in turn allows them to take more emotional risks, including reaching out to help others in need (Barnett, 1987). Additionally, helping children develop emotional and behavioral regulation skills is a strategy for furthering skills associated with demonstrating empathic concern for others (Song et al., 2018).

Another evidence-based suggestion is helping strengthen children's face-reading skills (Parker et al., 2013) because if children are unable to read facial expressions well or misidentify body language, it is hard for them to show empathy. Talking with children about their feelings, helping them find labels for their feelings and the feelings they observe in others, as well as about the causes and consequences of specific emotions supports emotional self-awareness associated with empathy (Castro, et al., 2015). Dewar (2020) suggests using "everyday moments" to notice and talk about when someone shows empathy in daily life and to discuss the consequences of showing or not showing empathy; even just asking children to stop and think about what other people are feeling can be an effective reminder for them to draw from their empathic capacity. Modeling empathy is another strategy, as children learn from experiencing adults' empathy with them and from watching adults close to them show empathy with others (MCC, 2018). Research by Ornaghi et al. (2014) suggest role-playing, fictional stories, and real-life narratives can support the development of children's perspective-taking skills, particularly when children are asked questions about what the characters think, believe, want, or feel and how we know that.

Research suggests people are more likely to empathize with those with whom they have close relationships (Gable & Reis, 2010), and thus, fostering a sense of connection and interdependence with others is another strategy for supporting empathy development in children. Similarly, since people tend to find it easier to empathize with those they perceive as similar to themselves (Smith, 1988), another strategy is helping children to look for commonalities with others. Yet while it is easier to have empathy for people close to us or similar to us, it is also important to model for children empathy with many types of people (MCC, 2018). Thus, it is recommended caregivers and teachers expand children's circles of concern and caring actions, helping children learn to "zoom in" to tune in carefully to others, but also "zoom out," taking in multiple perspectives of people, and then guiding children toward some simple but relevant and appropriate ideas for caring and service-oriented action that involve doing with and not just for others (MCC, 2018).

In addition to strategies such as these, there are many, often school-based, interventions to support empathy within the context of social and emotional learning (SEL). The literature on SEL suggests interventions beginning earlier in

development and continuing longer result in greater and more enduring benefits than shorter interventions that start when children are older (Ramey & Ramey, 1998). Additionally, there is evidence to support the strategy of early intervention supplemented by later intervention, toward gaining the most beneficial and enduring outcomes (Landry et al., 2008). Developmentally-tailored intervention strategies are important, as a mismatch between a child's capacities and a practitioner's perceptions of those capacities can greatly reduce the intervention's efficacy (Noam & Hermann, 2002). And it is important to note that some children may show relatively high levels of baseline empathy-related responding relative to others, regardless of age, as age provides only a general estimate of developmental capacity (Durlak et al., 1991). In addition to the importance of developmentally-responsive interventions and embedding empathy interventions within SEL, research has shown that effective programs provide repeated opportunities to practice developing skills and behaviors within the program structure and beyond in real-life situations (Durlak et al., 2011). Particularly for young children, cognitive perspective-taking can be challenging, and thus sustained practice is important (Pecukonis, 1990). Also, the analysis by Malti et al. (2016) suggests that empathy interventions should support empathy-related responding in its entirety, as targeting higher numbers of empathy-related constructs was associated with intervention efficacy.

In the context of supporting children in developing empathy with animals, there is limited research exploring the extent to which the mirror neuron functioning of emotional sharing can take place between humans and animals (rather than only human to human and animal to animal emotional sharing). Initial evidence suggests it may (Myers, 2007), and thus children's capacity to observe another person and respond to the stimuli similarly is thought to extend to a capacity to observe an animal and similarly respond to the stimuli. Research also suggests empathy with animals develops similarly to empathy with humans (Ruckert, 2016). It develops over time and is reinforced and supported (or discouraged) through children's interactions with the world. As children's brains develop, they move from simple affective responses to more complex, nuanced, and abstract reasoning, allowing them to transition from seeing animals as anthropomorphic peers to predict or imagine the experiences and perspectives of animals very different from themselves (Ruckert, 2016).

While the psychological processes known to be associated with empathy with humans apply to empathy with animals and nature (Myers, 2007), Tam (2013) indicates they are not reducible to each other, and the exact parameters in these processes are target-specific. For example, connectedness with others fosters empathy with people, and connectedness to the natural world appears to foster empathy with nature (Tam, 2013). However, it may also be that for those who consider themselves part of nature, empathy with humans actually entails empathy with animals and/or nature and vice versa (Tam, 2013). Consequently, strategies to help children develop an environmental identity may be another way to support the development of children's empathy with animals and nature. Also, since children are biologically hard-wired to nature, children may find it easier to relate to and bond with animals, and thus learning empathy in the context of animals may serve to support the development of empathy with humans.

### **Significance of Empathy in Prosocial and Conservation Behavioral Contexts**

Empathy is thought to play an important role in successful social interactions, enabling children to predict others' actions, emotions, and intentions (Bernhardt & Singer, 2012). Additionally, children high in empathy show more prosocial tendencies such as comforting, altruistic, and responsive behaviors toward peers (Miller & Jansen op de Haar, 1997). Similarly, Miller et al. (1996) found prosocial behavior in the form of helping a peer in distress was most likely to occur when children had both high moral reasoning and well-developed perspective-taking abilities. Thus, while affective empathy is important in motivating prosocial behavior, cognitive empathy is also needed (Malti et al., 2009), as together they appear to be closely connected with one's propensity to relieve another's suffering through action (Pittinsky & Montoya, 2016). Likewise, the analysis by Malti et al. (2016) similarly suggests the various components of empathy-related responding may work in concert to influence prosocial behavior. Empathy also may partially mediate the relationship between early prosocial behavior and later prosocial dispositions, suggesting empathy may be part of a larger prosocial personality trait that develops in children and motivates helping behaviors into adolescence and young adulthood (Eisenberg et al., 1999).

Environmental writer David Sobel has been a longstanding proponent for fostering empathy in young children, suggesting it serves as a foundation for environmental stewardship as children grow (1996). Empathy in the context of conservation seems similar to environmental sensitivity, which is a set of affective characteristics that result in an individual viewing the environment from an empathetic perspective (Sward & Marcinkowski, 2005). Conservation caring is a term also appearing in the literature. Rabb and Saunders (2005) define it as including cognitive elements toward valuing nature, affective elements stemming from experiences, and caring actions, whereas Skibins and Powell (2013) use conservation caring more generally to describe how zoo visitors think, feel, and act for a specific species.

It is thought that empathy with animals can activate empathy more broadly toward the natural world (Sevillano et al., 2007). Tam (2013) uses the broader term dispositional empathy with nature, suggesting it predicts biospheric concern more broadly and correlates with support for and frequency of environmental behaviors. Other research similarly suggests action for the environment is sometimes motivated by feelings of empathy. For example, Shelton and Rogers (1981) found those who had taken the perspective of a suffering animal exhibited stronger compassion and intention to protect that species. Research by Berenguer (2007) indicates a relationship between empathy with other living things and adults' intention to protect nature, which is consistent with Tam's finding of a positive relationship between empathy with nature and support for and frequency of environmental behaviors (2013).

Interestingly, research by Pfattheicher et al. (2016) found those who feel compassion with other humans were more likely to hold pro-environmental values and promote conservation of nature. Likewise, Czap et al. (2015) found that people who were asked to put themselves in the place of people affected by a conservation issue were more likely to support conservation action. While this may suggest a transferability between empathy with humans and empathy with nature, it also may be reflective of Tam's (2013) speculation that for those who consider themselves part of nature, empathy with humans may entail empathy with nature and vice versa.

Young et al. (2018) advise caution is needed though, as the strength of the relationship between empathy and behavior may be based on how closely the behavior is linked to the emotional experience. Gosling and Williams (2010) suggest feeling connected to nature may enhance dispositional empathy with nature, and empathy likely mediates the relationship between connection to nature and conservation behavior. Thus, empathy can play a role in environmental behaviors, but is likely insufficient toward achieving conservation behaviors, particularly when the behaviors are abstract or complex, or when barriers come into play (Young et al., 2018). While more research is needed, Tam (2013) advises taking the construct of empathy seriously in our quest to understand and promote humans' relationship to nature, as well as to motivate conservation behavior.

## EVALUATION METHODOLOGY

In light of the significance of empathy in prosocial and conservation behavioral contexts, and in light of its relevance to social-emotional learning, which is an emphasis in early childhood education, empathy is a timely and meaningful construct to study within the context of nature preschools. Thus, the potential of a nature preschool, and specifically a zoo-based nature-preschool, to foster children's empathy was explored in the context of program evaluation of the Lake Superior Zoo Nature Preschool. Given nature preschools' emphasis on supporting development across the domains alongside their provision of sustained opportunities for time in nature, there seemed the theoretical potential for nature preschool to be a promoter of empathy. The guiding question was as follows: Did participants' empathy with humans, animals (non-wildlife), and wildlife increase across the duration of the preschool year, and if so, was the increase different from what would be expected developmentally and from cognitive maturation across the preschool year?

### Program Description

Our evaluation utilized a pre-experimental pretest-posttest design with ten preschool participants at the Lake Superior Zoo Preschool, located in northern Minnesota (USA). This preschool is considered a nature preschool, which differs from non-nature preschools in philosophy as well as in terms of instruction and in the time allocation of the preschool day. Nature preschools have a nature-focused, child-directed play philosophy, where the majority



of the day, regardless of weather, is spent outdoors in nature play (defined for this study as child-initiated play that takes place in and with nature). As the Lake Superior Zoo Preschool intends to serve a diverse audience, the program operates as an extended-day program to meet the needs of working parents. Thus, the preschool day is 7:30 a.m. to 5 p.m. This includes approximately four to five hours of daily nature play that occurred primarily in a minimally managed outdoor space, as well as about one hour of indoor free play, and one hour of rest/nap time. Additionally, teachers typically lead loosely structured, playful learning experiences for approximately 15-30 minutes each day. While the overarching approach is considered emergent in terms of the curriculum approach, the social-emotional curriculum Second Step (see [www.secondstep.org/](http://www.secondstep.org/)) is utilized daily at lunchtime. As a part of this curriculum, children watch puppet shows, answer prompts about picture cards, and play games about concepts such as attention and emotion regulation. See Figure 2 for the logic model describing the Lake Superior Zoo Preschool and its theory of change.

### Data Collection Instrument and Procedures

An online search for potential instruments suggests assessing empathy is challenging due to a lack of comprehensive measures that tap all three dimensions of empathy and a lack of measures that have been validated for use with children, and particularly young children. One existing instrument, the Young Children's Empathy Measure with Humans and Animals (Poresky, 1980), had the potential for use in the evaluation at hand. It is comprised of four verbal vignettes for home visitors to read to preschool children to probe their cognitive understanding and affective responses to situations involving sadness, fear, anger, and happiness. For each of the four vignettes and photos, an interviewer asks and then writes down the responses on the two aspects of empathy by asking the child "How does the child feel?" (cognitive perspective-taking) and "How do you feel about this?" (affective empathy/emotional sharing). The empathy vignettes in the original instrument are sadness ("A child has just lost its best friend."); fear ("A child is chased by a big, nasty monster."); anger ("A child really wants to go out but is not allowed."); happiness ("A child is going to his/her favorite park to play."). Additionally, the vignettes are asked a second time in the context of a pet dog to assess empathy with animals. The St. Louis Zoo (Missouri, USA) appears to have used a similar assessment (Interview Method for Empathy for Animals and Other Children, Niedbalski and Seger, n.d.), modifying the questions to be: How does the animal feel? How do you feel? The vignettes they used are as follows: The animal's/child's best friend has flown/moved away; The animal/child hears a thunderstorm with loud thunder and bright lightning; The animal/child is going to play with its favorite toy, and another animal/child steals this animal's favorite toy.

For the evaluation at hand, we further modified this instrument to use slightly different vignettes and have a total of 12 vignettes with accompanying photos (4 for empathy with humans, 4 with pets, and 4 with backyard wildlife). We also included the question "What would you do" (to assess empathic concern). Thus, the three questions, and the associated empathy component, for each vignette are as follows:

- How would the child/animal feel? (cognitive empathy: feelings identification and perspective-taking)
- How do you feel about the child's/animal's situation/scenario? (emotional empathy: emotional sharing)
- What would you do or say to the child/animal? (motivational empathy) (asked for all vignettes but the happy one).

For the photos, a decision was made to use faces where gender is not clearly apparent, and refer to the child in the picture as a child (rather than girl or boy), to avoid adding in a confounding variable and having the responses potentially be influenced by the degree of familiarity/similarity to the preschool participant. Because of the possibility of a child having prior negative experiences with dogs, the child was also asked if they would like to see pictures of/talk about a dog or a cat, and then based on the child's response, that set of pictures would be used (recognizing that it introduces a confounding variable, as the pictures used – cat v. dog – may not illustrate the same degree of emotion, and thus photo variability could explain differing responses, rather than differing degrees of empathy).

Also, the decision was made to retain Poresky's (1980) approach of the child generating the name of the emotion in the scenario, rather than having the child choose from a set of four choices (does this child feel happy, sad, scared, or mad?) that could be more objectively scored. This decision was guided by a set of studies by Cassels and Birch (2014) that investigated the differences between open-ended and fixed choice response formats in assessing empathy in children. They found using an open-ended response option allowed young children to provide responses that captured emotional significance using age- or ability-appropriate language. In their study, responses were unrelated to verbal ability, which would seem counterintuitive due to the verbal demands of generating words; however, Cassels and Birch (2014) speculated that if study participants reached the minimum verbal ability required to simply speak about emotions, verbal ability wouldn't influence scores on the assessment due to the valence-based nature of the coding system (a child who responds with "Happy" to a positive-valence item would be as correct as a child with a higher verbal ability who may identify it as "Ecstatic" or "Joyful"). Further, the open-ended responses allowed researchers to focus on the perceptual recognition of the expression (rather than a combination of expression recognition and word recognition), and thus they concluded it provided a more accurate assessment of a child's ability to read perceptual cues to emotions and served as more representative of real-life emotion recognition situations and consequently a more ecologically-valid task (Cassels & Birch, 2014).

The scoring approach patterned after what was used in the Poresky (1980) measure, where the open-ended responses were assigned a numerical score according to a predefined scoring system. For cognitive and affective empathy, scoring was as follows:

- 3 = emotional response relevant to the domain (cognitive or empathy) and to the scenario and photo facial expression (situation described and the facial expression combined; for example, for scenario about going to the playground, the response of "happy" or "excited" or "joyful")
- 2 = emotional response relevant to the domain (cognitive or empathy) and the scenario or the photo facial expression (for example, response of "surprised" to the playground as it matches the scenario but not the photo)
- 1 = emotional response relevant to the domain (cognitive or empathy) but doesn't fit the scenario or the photo (for example, "scared" in response to the playground scenario)
- 0 = no response (or "I don't know"), or a non-emotional response (describing what the child is doing in the picture), or a response that doesn't match the empathy domain at hand (stating how they'd help when the question prompt was how do you feel or how do you think the child feels).

For motivational empathy, scoring was as follows:

- 3 = response that reflects care or concern and is relevant to the scenario and photo expression (for example, for the child who lost the toy, "I would help look for it" or "I would give the child one of my toys" or "I would try and cheer her up")
- 2 = response that reflects care or concern that is relevant to either the scenario or photo (but not both) (for example, "I would get her a band-aid" as it could be relevant to the girl with a sad face but not the scenario of losing a toy)
- 1 = response that reflects care or concern that is not relevant to either the scenario or photo (for example, "I would give her a drink of water")
- 0 = response that doesn't reflect care or concern or no response/"don't know"

At the beginning of the school year, parents were provided an invitation letter that explained the evaluation and asked for permission for their child's participation. Because of COVID-related restrictions regarding outside visitors in the preschool program, the evaluation instrument (four vignettes across human, animal/pet, wildlife contexts for a total of 12 vignettes) was administered by the preschool director to each child individually at the beginning of the preschool year and again at the end of the school year. Responses were coded using the scoring system described above. Due to the potential subjectivity in scoring, two people (the evaluator and the preschool director) reviewed the responses and provided a numerical score, toward coming to an agreed-upon score for each response.

## RESULTS

Table 1 summarizes the pretest and posttest scores, as well as the results of the repeated measures statistical analyses (dependent t-test). Results suggest children's empathy with humans increased across all three components (cognitive perspective-taking, emotional sharing, and empathic concern). Results for empathy with non-wildlife animals were the same as results for empathy wildlife animals, with significant increases in the emotional sharing and empathic concern, but not in the cognitive perspective-taking component.

**Table 1**

*Empathy Pretest and Posttest Statistical Data for Lake Superior Zoo Preschool Participants*

Construct domains	Pretest M (SD)	Posttest M (SD)	Significance of Change from Pre to Posttest
<b><i>Empathy with Humans</i></b>			
Cognitive Perspective Taking	10.20 (1.13)	11.90 (.32)	t(9) = 2.91; p = .02*
Emotional Sharing	7.10 (2.41)	11.10 (.87)	t(9) = 2.71; p = .02*
Empathic Concern	1.50 (2.54)	7.80 (2.09)	t(9) = 5.16; p = .001*
<b><i>Empathy with Animals (Pets/non-wildlife)</i></b>			
Cognitive Perspective Taking	10.20 (2.57)	11.80 (.42)	t(9) = 2.09; p = .07
Emotional Sharing	6.20 (4.61)	10.70 (1.25)	t(9) = 3.00; p = .02*
Empathic Concern	1.80 (3.79)	6.90 (3.47)	t(9) = 1.86; p = .02*
<b><i>Empathy with Wildlife</i></b>			
Cognitive Perspective Taking	10.10 (2.33)	11.40 (.84)	t(9) = 1.86; p = .10
Emotional Sharing	6.60 (4.29)	11.20 (1.23)	t(9) = 2.78; p = .02*
Empathic Concern	1.80 (3.22)	6.60 (3.94)	t(9) = 2.58; p = .03*

*Note:* Maximum score for Cognitive Perspective Taking and Emotional Sharing is 12; Maximum score for Empathic Concern is 9.

## DISCUSSION

This evaluation focused on the *potential* for nature-based, zoo preschool participation to support empathy development in young children. The data from this small-scale evaluation indicate children's emotional sharing and empathic concern significantly increased over the preschool year across the three contexts of empathy with humans, non-wildlife animals, and wildlife. In light of literature suggesting affective empathy develops in the first few years of life and is relatively stable thereafter (Davidov et al., 2013), the increase in preschool participants' emotional sharing and empathic concern is perhaps different than what would be expected developmentally and through cognitive maturation alone.

While cognitive perspective-taking significantly increased in the context of empathy with humans, it did not increase in the two animal contexts. It is important to note that for all three contexts (humans, non-wildlife animals, and wildlife), cognitive perspective-taking scores were already quite high at the beginning of the year (average scores were over 10, with the maximum score being 12), whereas pretest scores for emotional sharing and particularly empathic concern were much lower. Thus, the lack of significant increase in cognitive perspective-taking in the context of animals may be reflective of a ceiling effect (and children already possessing that component of empathy before the start of the preschool year). Also, the difference in cognitive perspective-taking in the context of humans v. animals could be reflective of the concrete thought characteristic at this age; taking the cognitive perspective of an animal might entail more abstract thought than taking the perspective of another person.

It is important to note COVID-related restrictions limited the number of preschool participants in the program, and also limited interactions with other preschool sites. And given the stress COVID placed on early educators and caregivers, and amid uncertainty regarding in-person attendance, quarantine, and other related issues, it was not feasible to build control groups into this evaluation at hand. Thus, in light of the small sample size and lack of a control group, it is not possible to attribute these increases in empathy to program participation, as increases could be due to some other external influence in concert with developmental maturation over the school year. Nor does the evaluation at hand allow us to determine if the nature-based approach, zoo setting, or any other particular aspect of the program were responsible for any increases in empathy. Further research is needed to investigate if, why, and how these program components work individually and in concert with each other to support empathy development, alongside cognitive maturation across the preschool year.

Looking forward, future research could be designed to investigate how changes in zoo nature preschool participants' empathy compare to the empathy development of children attending farmyard nature preschools, non-animal focused nature preschools, and more traditional (non-nature) preschools. Also, further research should include measures of fidelity of implementation to document and describe what teachers are doing (how the philosophies/strategies translate into on-the-ground practices) to better understand how the practices and strategies support empathy development. And ideally, future research would explore how nature preschool influences empathy development in a larger and broader sample of children toward establishing the extent to which findings are generalizable. A larger sample would also allow for correlational analyses among the components of empathy and across the human, non-wildlife, and wildlife contexts; this would add to what is known about the extent to which empathy with humans and empathy with wildlife overlap, particularly when children have strong environmental identities, as suggested by Tam (2013). In addition to the inclusion of control groups and utilizing a larger sample, future research would benefit from a mixed-methods approach that could better illuminate how children's empathy develops in response to specific contexts, strategies, and settings, as well as its transferability across human and animal contexts.

Based on the literature regarding the development of empathy, it also is interesting to consider the pretest levels of three components of empathy. Across all three contexts of empathy with humans, non-wildlife animals, and wildlife, cognitive perspective-taking was higher than emotional sharing. This is important to note in light of the child development literature referenced earlier suggesting the differential developmental pattern, with the affective components of empathy emerging during toddlerhood, whereas cognitive components gradually increase from early to late childhood (Davidov et al., 2013). Thus, it seems plausible that the preschool children in this evaluation developmentally had the capacity for affective emotional sharing, yet possessed levels (evidenced by pretest scores) that left room for being nurtured through preschool participation, thus making the growth observed within the zoo preschool participants at hand even more meaningful. Also, the lower levels of empathic concern at the pretest level make sense, in light of the literature suggesting emotional sharing may lead to empathic concern with further cognitive processing of the other person's state (Eisenberg, 2000) and with the contribution of emotion regulation skills (Hay, 2009). Through the course of the preschool year, participants' level of emotional sharing increased; and in light of the high pretest and posttest scores for perspective-taking, it makes sense that preschoolers' empathic concern scores also significantly increased. Given the intertwining of self-regulation with empathic concern, future research might also include measuring changes in self-regulation, especially in light of research suggesting nature play/nature preschool's positive impact on self-regulation (Kochanowski & Carr, 2014; Ernst et al. 2021).

In summary, while the significant increases in empathy components are important to highlight, their meaningfulness increases when considered in the context of the differential developmental pattern of empathy components, as in doing so suggests further reason to speculate that something more than developmental maturation is at play. Whether the source of increase is time in nature, the social-emotional learning curriculum activities, peer socialization, or the opportunities to practice empathy for others and empathy for animals within the preschool and extending outward in the context of the zoo setting, it is encouraging that children's empathy increased. This evaluation underscores the need for further study regarding nature-based preschool as a strategy for nurturing and reinforcing children's empathy development. Peter Kahn, a researcher at the University of Washington, suggests time in nature can soften negative-conditioned mental patterns: "If you can find nature, engage with it and get your heart rate down, then your mind begins to settle. When your mind isn't ruminating, it can then open to a wider world, where there's great beauty and healing" (Ma, 2020, para. 13). Nature's calming qualities allow children to attend to the deeper, more emotional lessons of life. Perhaps empathy may be one of those "lessons" that can be attended to and nurtured through nature preschool.

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**Lake Superior Zoo School Logic Model**

<p><b>Situation:</b> Given local childcare shortages (Wilder Research, 2018) and SES, racial, and ethnic inequities within the nature preschool movement (Schimke, 2018), the Lake Superior Zoo is uniquely positioned to further their conservation mission and serve the community by providing fulltime care that expands and diversifies the number of preschool age children reaping the physical, cognitive, and social developments of nature play during the critical developmental window of early childhood.</p> <p><b>Zoo School Vision:</b> All children will develop the knowledge, mindset, and skills to love the diverse world around them and to flourish in Kindergarten and beyond.</p> <p><b>Zoo School Mission:</b> To inspire the healthy social emotional, physical, creative, and cognitive development of young children through close-up experiences with animals &amp; nature.</p>					
<p><b>Inputs</b></p> <p>Staff with knowledge, skills, and dispositions for supporting nature-based ECH learning and dev</p> <p>Evidence base</p> <p>Stakeholders</p> <p>Resources</p> <p>Zoo grounds, animals</p> <p>Indoor and outdoor learning/playing spaces</p>	<p><b>Strategies</b></p> <p>Consistent warm, responsive, &amp; supportive care</p> <p>Learning experiences across developmental domains that emerge from:</p> <ul style="list-style-type: none"> <li>- daily, sustained periods of child-directed, unstructured nature play</li> <li>- holistic, developmentally appropriate, teacher-directed, nature-rich, playful learning experiences</li> <li>- developmentally-responsive, social-emotional learning opportunities grounded in SEL curriculum (Second Step and Conscious Discipline)</li> <li>- nature- and animal-rich storytelling and literature</li> <li>- close-up animal observations and interactions</li> <li>- opportunities to care for animals and nature</li> </ul> <p>Interactive socialization regarding children's interest in wildlife, nature and the world around them</p> <p>Modeling of empathy, prosocial behavior, nature affinity, and stewardship</p>	<p><b>Outputs</b></p> <p>Full day, full week nature preschool</p> <p>Preschoolers who have secure attachments with teachers, positive relationships with peers, and engaged in active, joyful, and meaningful nature-rich experiences</p>	<p><b>Learning Outcomes</b></p> <p>Learning and development across MN ECIIP areas:</p> <ul style="list-style-type: none"> <li>- Approaches to Learning</li> <li>- Social and Emotional Learning (SEL) (*including empathy and self-regulation skills)</li> <li>- Language, Literacy &amp; Communication</li> <li>- Arts</li> <li>- Social Systems</li> <li>- Physical Movement Dev</li> <li>- Mathematics</li> <li>- Scientific Thinking</li> </ul> <p>Environmentally-Oriented Outcomes:</p> <ul style="list-style-type: none"> <li>- Curiosity and wonder toward nature</li> <li>- Reawakening/deepening of an affinity toward nature</li> <li>- Feelings of trust, autonomy and confidence within nature interactions</li> <li>- Wildlife and nature connections</li> <li>- Sense of interdependence &amp; expanded sense of self/env. identity</li> <li>- Emerging ecological/wildlife knowledge</li> <li>- Affective, cognitive, and motivational empathy</li> </ul>	<p><b>Desired Behavior</b></p> <p>Demonstration of skills and furthering of progress across developmental domains</p> <p>Respectful and caring behaviors toward others, animals, and nature</p> <p>As children grow:</p> <ul style="list-style-type: none"> <li>- Prosocial behavior (interacting with/ responding to others in prosocial ways)</li> <li>- Environmental stewardship &amp; conservation behavior</li> </ul>	<p><b>Intended Impact</b></p> <p>Children flourishing in Kindergarten and throughout their lives</p> <p>Strong and sustainable social and ecological communities with citizens who co-exist compassionately, collaboratively, equitably, productively &amp; peacefully and who respect, value &amp; conserve wildlife and wild places</p>
<p><b>Lake Superior Zoo</b>    Close up animal encounters    Visitors engaged in free choice learning</p>		<p>Connections to Wildlife</p>	<p>Conservation Behavior</p>	<p>Wildlife Conservation</p>	



<p><b>Theory of Change (Strategies ⇌ Outputs)</b></p> <ul style="list-style-type: none"> <li>-Daily interactions between caregivers and young children have a significant influence on children's neurological development, psychological capacities and social adjustment, and overall growth and development (WHO, 2004).</li> <li>-Warm, responsive, and supportive care fosters secure and positive attachments between children and caregivers and a sense of community where children can flourish (Zhou et al., 2002).</li> <li>-Developmentally-appropriate environmental education for young learners involves developing empathy and curiosity through frequent and on-going play-based learning experiences and explorations that engage the senses and are authentic, multidisciplinary, and locally-based (NAAEE, 2010). Providers of early childhood EE programs have a shared and collective responsibility for helping children meet a common set of developmentally appropriate expectations that are conducive, but not limited to, environment/nature-related learning.</li> <li>-Holistic, emergent, playful learning is developmentally appropriate and responsive; when coupled with unhurried, nature-rich experiences and settings, young children engage in active and joyful ways (Luu et al., 2017).</li> </ul>	<p><b>Theory of Change (Outputs ⇌ Outcomes)</b></p> <ul style="list-style-type: none"> <li>-Children joyfully and actively engaged in experiences are better able to attend to, interpret, and learn from experiences (Luu et al., 2017). Unstructured play affords joyful, active engagement and is conducive to supporting children's progress in MN ECIP areas (Ernst, 2019; Dankiw, 2020).</li> <li>-As children spend time in nature, they develop feelings of trust, autonomy, and confidence, as well as connections with each other and the world around them; these connections support a sense of interdependence, a deepening affinity toward nature, and the beginnings of environmental identities, from which in due time can be drawn upon for participating in wildlife conservation and for envisioning and creating a healthy, just, and sustainable future (Green, 2019; Ernst, 2019).</li> <li>-Unstructured nature play fosters connections with and affinity toward nature, as does time in nature with a caring, "interactive socializer" adult role model (Chawla, 2009). While there are clear benefits for child-initiated nature play, promoted action experiences where caregivers actively encourage nature play and make opportunities available are also important (Reed, 1996). Social interactions within cultural contexts influence not only how children directly experience the world, but also how they integrate the values they are developing into their identity. Thus, caregivers become an important influencing factor on the extent to which children spend time in nature, but also on the extent to which they value nature experiences (Eccles &amp; Wigfield, 2002).</li> <li>-Affinity for wildlife and nature supports affective empathy toward the natural world (Kellert &amp; Wilson, 1995), and an affective relationship between children and animals is a powerful building block for care for the natural world (Kellert, 2002). Empathy may mediate the relationship between connection to nature and conservation behavior (Gosling &amp; Williams, 2010). Emotional empathy alongside cognitive empathy supports the motivational empathy that is related to caring behavior in social and conservation contexts (Malti et al., 2009).</li> <li>-Empathy is more malleable in early childhood than in other developmental periods, and can be nurtured through secure attachments with caregivers and strategies that build emotional and cognitive empathy alongside self-regulation skills (Hays, 2009). Developmentally-tailored SEL curricula with frequent practice of skills in real life settings can supplement the empathy/SEL development that happens naturally in positive, play-based peer communities (Durlak et al., 2011; Robinson &amp; Ernst, 2020).</li> <li>-When children have an expanded sense of self that includes nature, supporting empathy toward nature/wildlife (stories, live animal encounters, empathic modeling, practice, and positive reinforcement) can reinforce empathy toward humans (and vice versa). Supporting interconnectedness in young children toward an expanded sense of self (environmental identity) can be an avenue for fostering empathy with wildlife and nature and with others (Tam, 2013; Green, 2019).</li> <li>-Empathy can be a bridge to equity. Empathy can widen one's circle of moral concern and build connections that support equity and justice, which are integral parts of sustainable social and ecological communities (Silva Parker, 2013).</li> </ul>
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## Exploring Child-Family-Nature Interactions During Family-Led ‘Nature’ Tours in Alaska

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### ABSTRACT

This article presents Family Nature Tours as a participatory method for exploring children’s human and more-than-human-nature interactions within the context of the family. Through equipping children with wearable cameras during family-led outdoor activities, this qualitative study provides insight on what non-rural Alaskan families consider “nature” experiences and the values of nature demonstrated by children within the context of the family. Findings revealed that children whose behaviors reflected a dominionistic value, aggressive tendencies towards other living beings, also demonstrated a negativistic value by engaging in activities that diverted their attention from the natural setting. All children, to various extents, expressed a naturalistic value through engaging in exploration, play, and imagination. Findings revealed that some families fostered a scientific value through learning about different plants and animals in the environment, while others modeled an apathetic response. Affordances in wild or groomed “natural” landscapes generated varied opportunities for children to develop their relations with other living beings. This article reveals variations in formative child-family-nature dynamics, offering insight on opportunities to link children’s formative family nature experiences with environmental education.

**Keywords:** phenomenology, family tours, environmental education, wearable cameras, Alaskan children, relational values

The family is “the nexus” in which all learning occurs; it is one of the most influential contexts in which values, beliefs, and orientations, and subsequently behaviors, are formed. The significance of family and its influence on a child’s life is well recognized in both traditional child development theories (Bronfenbrenner & Morris, 2006; Piaget, 1952; Vygotsky, 1962) and sociological understandings of childhood (Corsaro, 2018). In Environmental Education (EE), the role of family in shaping past and present lived experiences has been discussed in the significant life experience literature (D’Amore & Chawla, 2018), and in more recent years, in the age of the Anthropocene (Malone, 2018). Home is a place where children spend a large portion of their time, and in our fast-paced postmodern society it is crucial that we pay attention to the everyday interactions occurring within the family unit, that shape how children, come to see themselves in relation to others in the living world (Rousell & Cutter-Mackenzie-Knowles, 2019). While EE research has considered familial factors in many different contexts, studies for the most part have involved families with a vested interest t (i.e., ‘green’ families, families participating in EE programs). In other words, there is a need to develop more inclusive and participatory approaches, which include the perspectives of all families regardless of their backgrounds and/or environmental orientations. Thus, the purpose of this paper is twofold. First, Family Nature Tours are presented as a participatory methodological approach for exploring children’s human and more-than-human-nature interactions within the context of the family. Second, descriptive findings from initial piloting of the Family Nature Tour method with Alaskan children and their families will be presented in order to critically consider the various ways in which family values shape children’s orientation towards other living beings in their environment. This inquiry is, therefore, not driven by the question of *if* families influence children’s values and behaviors, rather through critical examination of first-hand family nature encounters, this study looks at *how* values

and behaviors are shaped and informed during parent-child and sibling-child encounters in family-selected “nature” settings.

### **Families in EE Research**

EE research has addressed the context of family from a variety of angles in formal and non-formal learning settings. Early studies involving the family examined the transmission of knowledge from environmental programming to the home. However, in evaluating the after-effect of environmental programming, findings show that the transfer of environmental information and ideologies from children to families cannot be assumed (Ballantyne, Fien, & Packer 2001; Sutherland & Ham, 1992). Rather participating in collaborative action-oriented processes that empower children, families, schools and community members to create change in their communities has proven to lead to more positive outcomes (Ballantyne et al., 2001; Llata-López et al. (2017); Tal, 2004; Volk & Cheak, 2003).

Correlational studies have examined relationships between parents’ and children’s environmental values and behaviors through isolating certain variables including parental work experience and education, socio-economic status (SES), and environmental knowledge, concern, and behaviors (Hampel, Holdsworth, & Boldero, 1996; Leppänen, Haahla, Lensu, & Kuitunen, 2012; Meeusen, 2014). Positive correlations have also been noted between the environmental attitudes of parents and their children (Leppänen et al., 2012; Meeusen, 2014). However, such studies have been limited to measurable variables and reveal little about lived-experiences and the contextual attributes of child-family-nature interactions.

Studies have also considered the intergenerational processes, that is, the interactions (verbal and non-verbal) that shape family members’ ecological understandings and environmental perceptions. Payne (2010) looked at the ecopedagogical practices of ‘green families’ in Australia, adding to understanding of how the intergenerational transmission of an “everyday environmental ethic and ecopolitic” might be transmitted within the family slowly over an extended period of time (p. 209). Spiteri (2018) considered the contexts of family and school influences on children’s environmental perceptions, utilizing multiple methods, including home and school observations, conversational interviews, children’s interpretations of photographs, and children’s drawings. Findings revealed that children’s knowledge and attitudes about their environment are culturally and socially-constructed based on their local context, family worldviews, and life experiences.

Studies of non-formal learning environments such as zoos, botanical gardens, and nature centers reveal ripe opportunities for intergenerational and active learning (Zimmerman & McClain, 2014). Findings show that well designed exhibits can enrich families’ ecological understandings and foster positive environmental values and behaviors (Kopczak, Kisiel, & Rowe, 2015) and effectively challenge family beliefs (Esson & Moss, 2013). Interactive dialogue among family members (and with interpretive staff) is also beneficial for increasing children’s ecological understanding (Kopczak et al., 2015). Additionally, learning is enhanced when families position children as active participants in the process (Zimmerman & McClain, 2014). Studies also show that families’ prior knowledge gained through informal learning (i.e., Internet, books) and previous experiences inform family experiences in non-formal EE settings (Zimmerman & McClain, 2014).

Taken together, past research has included families from various programs and settings; approaches have also extended beyond formal to non-formal learning environments where families go to spend time together (Esson & Moss, 2013). However, families that visit nature centers tend to represent a certain demographic of families. As Llata-López et al. (2017) pointed out, there is a need to expand our research and educational efforts to reach families who may or may not have what we consider a strong environmental orientation. Family and educational partnerships form a two-way street (Allen, 2007). In other words, as educators, we should not only be concerned with transmitting knowledge from the school to the home, we should also actively seek out ways to tap into the funds of knowledge that children bring from family life into their environmental experiences.

## Relational Values in Child-Family-Nature Interactions

Research on relational values remains important in understanding socio-ecological systems, specifically in studying meanings persons and cultures attribute towards natural environments (Gould et al., 2015). In this study, families are recognized as having their own culture, or set of values, and it is these relational values that influence the way children learn to act and relate with natural environments. Values-related development represents the convergence between emotion and intellect (Kellert, 2002). Similarly, in a family-systems model, parental beliefs (affective) and their knowledge, skills, and competencies (intellectual) can positively or negatively influence parent-child interactions and the way children learn and develop (Bronfenbrenner, 1979; Trivette, Dunst, & Hamby, 2010). While Bronfenbrenner referred to a “bioecological theory” of child development, he only generally discussed social and environmental factors and did not specifically address nature experiences. Kellert (1997) on the other hand, articulated nine basic values implicated in children’s orientation/relations with the natural world. These values are expressed as tendencies and can be strong or weak, varying greatly among individuals, groups, or in this case, families (Kellert, 2002). There are some common attributes shared among the values; therefore, it is challenging to attribute any one value to a specific interaction. However, for the purposes of categorizing the child-family-nature interactions that emerged during Family Nature Tours, five of Kellert’s (2002) values of nature (dominionistic, negativistic, naturalistic, scientific, and moralistic) were particularly helpful:

- (1) The *dominionistic* value reflects the urge to master and control nature.
- (2) A *negativistic* value reflects the avoidance, fear, and rejection of nature.
- (3) The *naturalistic* value expresses the desire for close contact and immersion in nature, occurring through exploration, discovery, and imagination.
- (4) A *scientific* value emphasizes the empirical and systematic study and understanding of nature.
- (5) The *moralistic* value reflects an ethical and spiritual affinity for nature. This includes the inclination to treat nature with kindness and respect. (pp. 130-132)

This research examines the relational interactions that occurred among children, their family members, and other living being and natural features. First, the research addresses the questions: What do non-rural Alaska families consider nature experiences? Where do they go and how do they spend their time? What relational values are expressed in child-family-nature interactions in particular settings and family activities?

## Framing, Approach, and Methods

Phenomenology centers bodily existence at the core of conscious and subconscious understanding of the world and other living entities (Merleau-Ponty, 1945/2002). It involves the study of *Dasein*, or being-in-the-world, in a particular time and place (Heidegger, 1962; Merleau-Ponty, 1945/2002). For a child, the context of being in the family, makes up a significant part of their lived experiences and informs the way they orient themselves in relation to others and their environments (Bronfenbrenner & Morris, 2006; Corsaro, 2018; Vygotsky, 1962). A phenomenological approach was used in this research to explore the somoesthetics of children’s family nature experiences. The term “soma,” according to Shusterman (2009), designates the “living, sensing, dynamic, perspective body” (p. 133). While “soma” refers to embodied, “aesthetics” refers to “feeling or sensitivity” (Iared, de Oliveira, & Payne, 2016). Affective experiences in nature, particular for children, precede language and reflective thought. However, researchers have found it challenging to identify data collection methods that capture the lived [pre-reflective] essences of being in the world (Iared et al., 2016). In this research, we utilized wearable cameras as a method for tapping into children’s embodied (pre-reflective) experiences of being in nature with family.

## Family Nature Tours

Family Nature Tours build upon the Sensory Tour method which have been used to study young children’s perspectives and experiences of their environments (Green, 2016, 2017, 2018). During a Sensory Tour, children are equipped with small wearable cameras around their foreheads. The lightweight cameras, goes where children go, sees what children see, and captures their sensory, behavioral, and emotional perceptions of their environment (Green, 2016). Children explore and collect video data on their own without the need for an adult researcher






prompting and prodding close-by with a video camera (Green, 2016). The lens of a wearable camera also allows researchers to observe firsthand children’s cognitive expressions – that is, a child’s expressed knowledge and skills. Furthermore, wearable cameras capture children’s self-talk, and their verbal and non-verbal expressions (Green, 2016). The method is participatory, children choose if, and when they would like to wear a camera and for how long. When a child is finished wearing the camera they simply tell the researcher (Green, 2016).

**Participants and context**

Between July and September 2018, eight Family Nature Tours were facilitated with four-year-old children and their families from an interior Alaskan city. All children enrolled in a preschool program were invited to participate. School administrators provided permission to use the site and families provided consent to participate in tours. Grant funding was used to compensate families for their time. Families choose which family members would participate in the Tour, where the Tour would take place, and Tour activities. One or two parents and at least one sibling(s) accompanied all of the children on their Tours. Table 1 provides a summary of Tour participants and locations. All Tours occurred during late afternoon or evening hours and lasted approximately 60-90 minutes. During Tours, the four-year-old child wore the wearable camera. Siblings and parents, if interested, were invited to wear the cameras for a portion of the Tour. This provided an opportunity to view the family activities from different perspectives. Additionally, the researcher carried an iPad during Tours to video and audio record informal conversations and interactions. Children lead most activities during Tours. However, parents guided certain interactions (i.e., driving an ATV, teaching about trees). Field notes were recorded after each tour, including a summary of activities, general impressions, and notable connections with other data. Videos and fieldnotes were downloaded and organized into folders for each child.

Table 1  
*Family Nature Tour Participants and Settings*

Child	Family	Setting Description	Location Photo
Joseph	Mother, Father, 2-year-old sister, 2-week-old brother	City park, pond, playground, and electronic game	
James	Father, 7-year-old brother	Field, forest trail, and pond	
John	Mother, Father, 9-year-old brother	Paved street (for bike- ride), neighborhood playground near river, backyard	

Brittany	Mother, 7-year-old brother, 10-year-old brother,	Property, driveway, and play structure	
Christopher	Mother, 8-year-old sister	Paved neighborhood road (for bike-ride)	
David	Mother, Father, 8-years-old sister	Field, forest trail, and pond	
Carol	Mother, 8-year-old sister	Botanical Gardens, pond and bridge	
Samantha	Mother, Father, 1-year-old sister	Wooded-trail (for ATV ride), and school playground	

**Data analysis: Searching for meaning in family micro-interactions**

Data analysis followed what Grbich (2012) described as an existential phenomenological approach, focusing was on “contextual relations” (p. 98). “Within these contexts (lifeworld – mundane daily occurrences, place – temporal and spatial location...humans have the capacity to respond and react to the situations and to relationships with others” (Grbich, 2012, p. 98). While the settings varied, the focus of our analysis was on the micro-interactions between family members, other living beings, and the human-built and natural environments (see Table 2). Micro-interactions refer to children’s experiences during particular situations that occurred during a Family Tour. The contexts of micro-interactions were critically analyzed to consider the setting, persons involved, observed behaviors and emotional responses.

Videos were first reviewed in their entirety to gain “intuitive/holistic understanding of raw data” (Grbich, 2012, p. 102). Brief notes were taken about the nature of each Tour, how it related to other Tours, and family-nature interactions. Videos were reviewed a second time, “summarizing data from each participant [family] to develop natural meaning units and central themes” (Grbich, 2012, p. 102). Through multiple viewings, readings and cross-comparison of data, themes emerged as overarching categories that characterized the way children and their

families interacted with other living beings and environmental features. Micro-interactions were then categorized within a “thematic index” (Grbrich, 2012, p. 102), relating to the five values of nature (dominionistic, negativistic, naturalistic, scientific, and moralistic) defined by Kellert (2002) (see Table 2). Descriptors include setting-child-family member(s)-actions. Organizing micro-interactions in this way allowed for the identification of trends in family activities and behaviors. During a third round of analysis, raw videos of family micro-interactions were revisited and transcribed for a more detailed reading. Transcriptions include verbal comments, non-verbal cues and behaviors, and contextual elements of the environment/setting. Due to space constraints, it is not possible, to present all micro-interactions that occurred during the eight Family Nature Tours. Rather for the purposes of this paper, particular segments of transcripts are presented to illustrate the overarching themes of each child’s family-nature interactions and the values of nature in which such interactions convey.

## **Findings**

### ***Where did families go?***

Families selected a variety of locations and activities for their tours. James and David’s families choose to hike through fields and a boreal forest at a bird migratory refuge. This setting provided opportunities for families to nurture children’s environmental competency by teaching them about the local flora and fauna. Both John and Christopher’s families elected to take bike rides on paved streets through their neighborhood. John rode tandem behind his Dad’s bike to a nearby park; while Christopher rode his bike with training wheels with his mom walking beside him. The biking part of John’s tour generated video of a paved road with no other notable interactions. Christopher stayed on his bike the entire time, which prevented him from physically interacting with features in his environment. Samantha rode on an ATV with her father along a wooded trail between her house and the school playground. Her father stopped occasionally, encouraging Samantha to observe bunnies and birds. Joseph, John, and Samantha and their families visited public playgrounds. The children spent a large portion of their time climbing and playing on playground equipment, which diverted their attention from exploring the natural setting. Brittany’s Tour occurred at her home ‘in the hills’ outside the city. Her property afforded many natural features (trees, dirt, and rocky hills) for her and her brothers to play and explore. Finally, Carol’s family visited the local botanical garden and their favorite pond.

### ***What did families do?***

The range of micro-interactions varied among families, however, as Table 2 reveals there were notable trends. The two children who demonstrated dominionistic values towards other living beings also engaged in activities that distracted them from the natural world around them. Even so, all children, to various degrees, exhibited a naturalistic value towards their environment through play and exploration: blowing dandelions, hiding in the tall grass, discovering rocks, picking flowers, kicking mushrooms, tasting raspberries, playing with sticks (to name a few). Additionally, two families demonstrated a scientific value of nature through observing and learning about the types of trees and aquatic life. This in turn, fostered ecological understanding and the development of empathy. One family applied their empathy through demonstrating a moralistic value of care for bees in a small pond. Taken together, mapping family activities helped us to take notice of the relational values demonstrated in child-family-nature interactions.





### ***Dominionistic - aggressive interactions***

Two children, Christopher (on his own) and Joseph (with his 2-year-old sister), demonstrated a dominionistic value, evidenced in aggression towards other living beings.

#### "Birdies, I'm going to eat you"

Christopher vocalized his aggression towards birds on his bike through the paved streets of his neighborhood with his mother walking beside him:

*"I see a little birdie," Christopher said, "another one."*

*"Arw, arww ..." he growled, "find birdies, I'm gonna eat you...Hey, find birdies, I'm going to eat you...You are going to get electrocuted!"*

Christopher noticed a bird sitting on an electric wire.

*"Die!"* he yelled.

His mother told him the birds were "fine" on the wire. However, Christopher continued, *"Hey flying birdies, I'm going to eat you. You are going to get electrocuted and die."*

Christopher rode his bike along the paved street of his neighborhood; besides his comments towards the birds he had little interaction with natural features in his neighborhood. When I arrived at Christopher's house, he told me to "go away" and turned back to play his video game on the T.V. in his living room. Christopher's aggression towards the birds may be influenced by the schemes of his video games; it is possible that he may also have been annoyed that his game was interrupted by the family nature tour. Interestingly, Christopher also expressed annoyance towards the "stupid flies" in his home. During my visit, he found a toy knife to try to "kill them."

#### Chasing Pigeons

Similarly, Joseph and his 2-year-old sister acted aggressively towards pigeons resting near a pond when his family was feeding ducks. Ironically, while his family "fed" one animal, the children sought to disturb the other.

Noticing pigeons on the grass, Joseph took a break from feeding the ducks to chase after the birds. His 2-year-old sister followed, shouting, *"Run!"*

The children noticed more pigeons on the other side of the pond.

*"Boo! Boo! Boo!... Boo!"* Joseph screamed while chasing them.

As Joseph got closer to the birds, some took flight and two stayed on the rocks. Joseph snuck up slowly.

*"Boo?...BOO!"* Joseph shouted aggressively at the two pigeons. Startled, they flew away.

Both Christopher and Joseph demonstrated hostility towards birds, while one verbalized it, the other acted on it. Neither Christopher's mother nor Joseph's parents became involved in their children's aggressive acts. While Christopher's mother attempted to correct his misconception about the birds getting electrocuted, she did not specifically try to redirect his hostile comments. Joseph's parents may not have been aware of his aggressive actions, which were only revealed during review of the video footage.

### ***Negativistic - nature distractions***

According to Kellert (2002), a negativistic value reflects avoidance and rejection of nature. Some of children's interactions outdoors could be considered nature distractions, whereas children's attention was focused on human-built (i.e., playground equipment) rather than natural features. Samantha climbed up and down a caged metal play structure with slides. Similarly, John spun dizzily on a merry-go-round, and Joseph climbed up and down a red plastic slide and ran eagerly back and forth on a large concrete slab while playing the "Fire Fighter" game.

#### Fire Fighter

Joseph played the stand-up electronic game twice, for over 10 minutes each time. By comparison, he only spent 3 minutes feeding the ducks with his family at the pond.

*"I'm fire,"* Joseph declared, pushing the button to start the game labeled *Fire Fighter*. The music started and Joseph ran eagerly from post to post hitting the buttons. A teenage girl joined, and Joseph pushed the button to restart the game for two people. *"No, you only get the reds,"* Joseph told the girl while he darted between posts, slapping the green-lit buttons. The older girl sought the pillars with red lights. Buttons beeped affirming when points were added. After about 40 seconds, the game concluded. Joseph cheered, noticing he had scored higher than his opponent.

Joseph played the game repeatedly; he was so enthralled with the electronic game that he took little notice of the old spruce tree, towering beside the concrete pad and lite-up pillars. His fast pace and insistent interaction with the electronic game was similar to his response towards the pigeons at the pond. Moreover, Joseph's parents stood along the sidelines, laughing and cheering him on. His familiarity with the game schemes revealed he had previously played it. This example reveals how electronic games installed at an outdoor park entice and draw children's interest, however, at the risk of distracting them (at least for a time) from the natural features of their environment.

Some children's preference for play with human-built environmental features was validated in their favorite summer nature activity drawings. Samantha drew a seesaw, Joseph a basketball hoop, and John a merry-go-round. Similar behavioral preferences towards human-built features were noted in a large-scale quantitative observational study on children's playground play (Sargisson & McLean, 2012). While playground play is not inherently wrong, its value is limited in terms of connecting children to natural attributes in their environment. Thus, it is important for families to consider finding a healthy balance between activities that may serve as nature distractions and activities that promote exploratory, ecologically conscious, and empathetic child-family-nature interactions.

### ***Naturalistic - play and exploration***

All of the Family Tours revealed children's inclination to explore and discover their natural environment (Piaget, 1952). Exploring the tall grass, climbing trees or hills, playing with sticks, and picking flowers were all common interactions among the children. These activities were supported by the affordances within the setting itself and by family values.

#### The Tall Grass

John and his older brother, Adam, explored the tall grass at the migratory bird refuge during their family nature tour.

*"Can we go in the tall grass?"* John's older brother, Adam, asked their father.

*"Yes,"* their father responded.

Adam ran off the dirt trail into the tall grass.

*"Whoa-who!"* Adam exclaimed, swinging his arm like an airplane.

John followed Adam into the grass slowly, taking it in...

*"This is some big grass in here!"* John exclaimed.

*"Yeah,"* his father agreed.

*"I don't want to get out of this big grass...its nice to me...!"* John stated, *"it's fun!"*

John's interest in the tall grass was prompted by his brother and supported by their father who encouraged the children to explore. According to Kahn (2002) a naturalistic value, is expressed through play and exploration and emerging oneself in a setting. Although he was initially hesitant, John enjoyed just being in the tall grass and he returned to it towards the end of his tour, stating, "it's fun!"

### Climbing a Hill

Brittany also explored off the beaten path, by testing her limits on the steep hill of her driveway.

*"Wanna see something else?... I... do... climbing,"* Brittany announced.

The rocks and dirt were loose and the foliage on the side of the driveway was full of vetch, an invasive species that grows rapidly over disturbed habitats in Alaska. Brittany took a few steps up the hillside and slipped.

*"Ah!...Oww!...Ow,"* She screamed.

The ground was shifty and the vines were pokey. She had nothing to grip with her hands or feet.

*"Mom!...Help!"* Brittany yelled, *"Help Mom! Up."*

*"Hold on to Piper... She'll pull you,"* her mom commanded, sending the family dog to rescue Brittany. Brittany laughed and grabbed Piper's leash. Brittany's mom gave her an extra push from behind as she summited the driveway.

Brittany zealously attempted to climb up the steep hill on the edge of her driveway. Her determination quickly turned to despair when she lost her footing on loose rocks without anything stable to grab onto. Brittany is the youngest child in her family. In this interaction, she appeared to be mimicking the adventurousness of her older brothers. During my visit, Brittany's 9-year-old brother raced up and down the steep driveway as fast as he could on his bicycle. In this way, Brittany's was attempting something risky just like her brother, however, she had not yet developed the skills to achieve it. When the challenge became too difficult Brittany countered back and relied on her mom and her dog for help.

### Picking flowers and exploring water

John picked a fluffy dandelion growing on the city park lawn. He blew the soft pollen at his brother. Next, John and his 10-year-old brother wanted to throw rocks in the river that bordered the park. However, the shoreline was primarily made up of mud and grass. Thus, John and his brother ran back and forth several times between the river and playground area to gather and throw handfuls of pebbles into the water. Their mother watched and giggled, while their father sat on a picnic table at the other end of the playground. Unfortunately, the riverbank alongside the manicured lawn limited the type of environmental experiences in which the two boys sought.

Brittany also picked a yellow dandelion on her family's property. She gave it to her mother who smiled and thanked her. Her mother's positive response influenced Brittany to pick another flower for the researcher. Both John and

Brittany's parents, in various ways, reinforced their children's interactions with flowers and rocks for the primary purpose of exploration and human enjoyment.

### ***Scientific - ecological understanding***

#### Learning about pollen and looking for fish

James also discovered wildflowers during two different occasions on his hike with his father. On the first, James attempted to pick a flower and accidentally broke it. His father assured him that it was okay because the pollen would spread to create a new flower. The second time, his father coached him in stepping through a marshy area to retrieve and "pinch" a flower off the vine. James learned from his father understanding of the lifecycle of a flower and how to carefully pick one to preserve it.

Near a small pond, James, his 7-year-old brother, and father looked for aquatic life.

James's brother laid on his stomach on the wooden planks of a bridge, close to the water. He played in the water with a stick, watching the ripples.

James leaned beside his brother on one knee, further away from the edge, *"What are you doing? ... be careful."*

*"Why?"* his brother responded, hopping up onto his knees.

*"I want to try to catch a fish."* his brother stated, *"Do you think there are some fish in here?"*

*"There are no fish in here,"* their father answered.

*"Why?"* James brother asked.

*"It's not suitable for fish,"* his father answered, before reading the interpretive sign, *"Hmmm... it does say that there are arctic grayling during high flood years..."*

James' older brother expressed his desire to catch fish. James' father indicated that he had begun to take James' brother hunting and berry picking, yet his father felt that James not yet old enough to participate. The interaction on the bridge revealed James brother's interest in harvesting food from the land, it also indicated a slight difference between James and his older brother's comfort level. His brother leaned close to the water, while James stood back advising him to be careful. This same hesitation was demonstrated in other interactions (i.e., entering the tall grass, picking the wild flower). Yet with encouragement, James readily gained skills and became more comfortable in the environment.

David and his family also explored aquatic life during their hike at the migratory bird reserve.

David lead his family to the bridge, stopping to read the interpretive sign.

*"See there are frogs here, tree frogs,"* David stated.

*"Yeah."* His mother agreed, *"And bugs, fish, bugs, ducks."*

*"And I saw... I think I saw that one,"* his 7-year-old sister pointed to an invertebrate on the sign.

*"Do you want to get close to the water to see if you can see them?"* their mother asked.

*"I'm looking for fish,"* David responded.

*"You are looking for fish."* His mother restated.

*"When are we going to stop and look?"* his mother asked when David kept walking. David's father also walked across without stopping.

*"When we see something,"* David stated.

His mother eventually led David to the edge of the water. *"Do you see anything? "Anything moving in the water?"* she asked.

*"No,"* he stated.

David's mother, like James's father, prompted her children's inquiry about flora and fauna in the setting. David, similar to James' brother, was looking for fish. Yet instead of slowing down to take a closer look like James' brother, he walked steadily across the bridge. His mother, on the other hand, prompted him to take a closer look. Similarly, both David and James' families engaged in dialogue and utilized the interpretive sign to learn about the environment (Kopczak et al.'s, 2015; Zimmerman & McClain, 2014).

### ***Moralistic - empathy and action***

#### Saving bees

Carol, her eight-year-old sister, and mother visited their favorite pond in the botanical gardens, where they applied their ecological understanding through action.

*"Are you alive?"* Carol asked.

*"Oh yeah, she's alive, she's alive... you need to take her out, you need to take her out! If any – if anybody's – if anybody's brave enough..."* her 8-year-old sister exclaimed while observing a bee floating in the pond.

*"You can be braver than me,"* Carol said.

Carol's older sister reached into the pond, grazing a leaf over the water gently lifting the bee out onto the wooden deck.

*"Yah, I saved it! Oh, there is another bee floating over there,"* Carol's sister noted.

*"Do you want to try Carol?"* their mother asked.

Carol ran to find a stick, bringing it back to the water.

*"Which one?"* she asked.

*"It's right there,"* her sister pointed.

*"Hey Carol, there is another one over here that needs saving,"* her mother said.

*"Okay, I'll get it."* Carol reached in the water and retrieved the bee with her stick.

*"Oh! It fell back in the water!"* her older sister noted, *"It's over there... pick her up!"*

Carol reached in to save the bee a second time.

*“There we go,” her sister encouraged, “now be gentle, be gentle.”*

This interaction showed how Carol and her sister exercised empathy towards other living creatures (bees) by rescuing them from the pond at the botanical gardens. Carol was at first nervous, she observed her sister until her mother encouraged her to try to rescue one herself. Even though she dropped it the first time, Carol, with support from her sister and mother, exercised persistency in reaching back into the water to bring it to shore. The family mentioned that the pond was a favorite place at the garden. Perhaps, the children had previously engaged in a similar activity.

### **Concluding Discussion**

While past research has shown that there is a positive correlation between the environmental attitudes of parents and their children (Leppänen et al., 2012; Meeusen, 2014), this study adds to the literature by examining *how* children’s values and behaviors towards nature are shaped and informed during parent-child and sibling-child encounters in family-selected “nature” settings. Findings showed that although children expressed interests towards similar phenomenon (i.e., birds, sticks, flowers, water), *how* they acted and behaved towards such phenomenon varied according to familial influences and the affordances offered in different settings (i.e., tall grass, wetland or pond, manicured lawn, playground and concrete features). Specifically, utilizing Kellert’s (2002) values of nature index, this study revealed how some children demonstrated dominionistic values through aggressive behaviors towards birds. One parent was aware of their child’s behavior the other was not; however, more concerning was that neither parent redirected their child’s aggressive interactions. Opposite of aggression, another child, with strong encouragement from her family, engaged in action to “save” a living creature (bee) from drowning in a pond. Thus, findings show how moralistic values towards nature can be modeled and nurtured through interactions with other family members.

Similarly, Payne (2010) argued that an “everyday environmental ethic” may be transmitted in families slowly over time. Findings revealed some small ways in which children’s value of nature were transmitted among family members even in the short timeframe of the family outings. For example, on several occasions James demonstrated hesitancy in interacting with environmental features. Yet with his brother’s modeling and his father’s encouragement James was willing to try new things and to learn about the local ecology (i.e., plant identification and pollination). Similarly, David’s mother encouraged him to read interpretive signs and make observations in learning about the local ecology. In this way, both James’ father and David’s mother modeled a scientific value of nature in nurturing ecological understandings. These findings coincide with past research on non-formal environmental learning programs. Specifically, our findings support family dialogue and well-designed exhibits (interpretive signs) in enriching families’ ecological understanding (Kopczak et al., 2015). However, unlike Kopczak et al. (2015) study, our family-led outings did not include a staff nature interpreter to teach children about the local ecology. Rather our study supported family-led outings, which by default designates family members as primary interpreters of an environmental setting. Our results show that some parents were keen to teach their children about the local ecology while others were less interested. Thus, ECEE researchers and practitioners should consider family outings as a starting point for nurturing environmental competencies, attitudes, behaviors, and values. As findings from this study show, the ways in which families interacted with nature varied; thus, there is no one right way to nurture children’s environmental competencies within the family context. Each interaction is different the strategies to support children and families will also vary according to family needs.

In terms of a naturalistic value of nature (Kellert, 2002), findings from this study show that all families can benefit from time spent outdoors (D’Amore & Chawla, 2018). To various degrees all the children in this study engaged in play and exploration of their environment and this was for the most part supported by all families. As stated previously, some families took children’s play and exploration in nature one step further in emphasizing ecological understandings (a scientific value), and nurturing children’s confidence, skills, and empathetic relations with other living beings (Malone, 2019).

Taken together, the family nature tour approach encourages families in their outdoor engagement and upholds the call for transgenerational research inclusive of parents/families (Rousell & Cutter-Mackenzie-Knowles, 2019). It meets families where they are at regardless of their environmental orientation (Llata-López et al., 2017). With that said, the family nature tour method is not a one-size-fits-all approach. Child-family-nature interactions are dynamic and fluid, variant and dependent on “contextual relations” - culture, place, and family dynamics (Grbich, 2013, p. 98, James, 2000). While families may act in certain ways in one setting, they may or may not interact in the same ways in another setting. Additionally, phenomenological and eco-phenomenological approaches are concerned with human and more-than-human experiences in the world at a particular time and place (Heidegger, 1962; Iared et al., 2016; Merleau-Ponty, 1945/2002). Thus, what constitutes an essence of experience at one point in time may not constitute an essence of experiences at another. Yet each experience informs another and is important in shaping how one comes to see themselves in relation to the living world. Thus, an in-depth look at child-family-nature interactions during early childhood helps us to critically consider the social-cultural attributes of children’s environmental identity formation. The family nature tour method provides opportunities for researchers to expand understanding of the dynamics of families of all shapes and sizes- from various cultures, geographical locations, and environmental or non-environmental orientations.

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## Making Maps as Creating and Constructing Experiences in a Prekindergarten Forest Classroom

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### ABSTRACT

Children are constantly working to make sense of themselves, their experiences, and their worlds. One way that children tend to do this is through creating artifacts. By engaging in discussions around, and interacting with these artifacts, teachers and educators are able to gain further insight into the experiences of children. Through observing children create and participating with them in discussions about their artifacts, the educator/researcher assembled a framework for understanding children's connection to created artifacts. The potential of mapmaking and artifact-based discussion to offer insight into experience are discussed.

**Keywords:** nature-based education, emergent curriculum, child-directed learning, participatory methods, ethnography, constructivism

One of the key mechanisms by which outdoor education is thought to have an impact on children's later dispositions toward nature is through the memories they create during their time in natural spaces (Chawla, 1998; Cleary et al., 2020), and through being outside more generally (Evans et al., 2018). Positive experiences in and memories of nature, then, may have important downstream impacts on attitudes toward the natural world (Broom, 2017). Therefore, assessing and creating rich experiences in outdoor contexts is an important component of early childhood educational initiatives, and a particular obligation of nature-based programs.

In this qualitative case study, I sought to discern the ways that a group of children (N = 9) interpreted their experiences in a forest during their days in an outdoor preschool program located in New Orleans. To do this, I invited the children to create maps of spaces within the arboretum where we spent our days. Some days, these maps were of places we set up class for the day, on other days the maps depicted the trajectory of our walks, or "wanders" through the forest. In particular, I wondered: What will the maps children co-create tell us about how the children are experiencing the forest? What use are these maps, these created artifacts, to the children in interpreting and processing their perspectives on the forest?

### Nature School: An Overview

**Context.** Nature School is located in New Orleans, Louisiana—a mid-sized city in the gulf south region of the United States where average year-round temperatures rarely reach below freezing. Nature School is a primarily outdoor nature-based school that operates within a 60-acre public arboretum (henceforth "The Forest" or "the forest") in New Orleans' City Park (see Arboretum Map in Appendix). The green spaces (which the children refer to as "classrooms"), vary in size, yet are all defined by an abundance of Live Oak trees with branches that extend to the ground, the presence of nooks and alcoves created by smaller trees and shrubs, and proximity to water. The children in a given classroom are never more than a ten-minute walk from other classrooms. Nonetheless, there are a variety of ways through which one might navigate the trails through the forest. This means that depending on the choices made, a walk through the forest would take as little as ten or as long as forty-minutes.

**Enrollment.** At the time of this study, Nature School enrolled 32 children that ranged in age from 3- to 8-years and were distributed across three classes: two Pre-kindergarten classes (enrollment 10) with children between the ages of 3 and 5 years, and one Kindergarten/First Grade class (enrollment 12) with children between the ages of 5 and 8. The participants in this study were 10 children in one of the Pre-kindergarten classes. Of these 10 children, five attended for the full day which began at 8:00AM and ended at 3:00PM. The remaining five children attended for only half of the day which began at 8:00AM and ended at 12:00PM.

**Philosophical Orientation.** The Nature School day is grounded in open-ended, child-directed play. As such, it does not require educators to follow a particular curriculum. Each day, therefore, is guided by the interests of the children. Two co-teachers lead the classrooms, and decide in concert with one another, and through observing the children, the pillars of their curriculum over the course of a given day, week, month, etc. Through an abundance of shared experiences in the natural world where children create art and story with their bodies and words, where children brave new paths amidst the ever-novel familiarity of the forest, the children of Nature School are assembling a store of experiences that will serve them well throughout their lives (Chawla, 1998; Bögeholz, 2006).

Another bedrock of the philosophical orientation of Nature School is its dedication to reflective practice in its teaching teams, and its emphasis on valuing the lived experience of the child. Reflective practice in early childhood is broadly defined as a metacognitive process where an educator considers how the ideas, actions, and interactions that occur within a classroom influence the experiences, relational trajectories, and lines of inquiry pursued therein (see Meier & Stremmel, 2010 for a detailed exploration). A critical component of reflective practice, thus defined, is the experience of the child on both individual and collective levels.

Given the centrality of this conviction to the philosophical orientation of Nature School, it is perhaps unsurprising that a central conviction of the current work is that the experience of the child is valuable *as it is being lived* and *in a particular child's childhood*. While Nature School uses a variety of methods to both document, support, and encourage others to see the value in children's lived experiences, one that became particularly salient (and inspired the current study) was mapmaking.

### **Maps are Meaning-Making Tools that Support Children in Processing Relationships with the Natural World.**

In both traditional and nature-based educational environments, maps are considered powerful tools that children use to connect with the spaces they inhabit each day. In *Coyote's Guide to Connecting with Nature* (Haas, McGown, & Young, 2010) mapmaking is included among what the authors refer to as the "Core Routines of Nature Connection" (pp. 58-59). A map, they assert is meaningful because it "brings the landscape [of our surroundings] to life as [a] diversity of natural signposts emerges through the connections [within the natural world]." (p. 58). Other research has also shown that children use maps to connect with and document their perspectives of classroom spaces in traditional school contexts (McCann, 2014), and as components of their reflections on outdoor spaces within their own preschool (Clark, 2007).

In the current study, I imagined that maps would occupy a space at the nexus of art and narrative, including observational drawings (art) and dictations (stories). While she refers to it as bookmaking, Carrie Green (2017), notes that invitations to create narratives of experience, and that creating art in forest contexts "provides a backdrop for children to reflect on the beauty and awe of nature," (p. 6). Maps, as conceptualized in this work, can be said to be books, or stories of a particular place or journey, and, therefore, avenues for reflecting on relationships with the natural world.

### **Maps are Tools for Developing Spatial Understandings**

Maps, another framework asserts, can provide insight into and work to develop children's spatial understandings. Geist (2016) writes that "each time children make a map, either on paper or mentally, they reexamine their surroundings [and] their previous representation of their world," (p. 50). While Geist approaches maps from a Piagetian perspective, he essentially echoes the assertion of Young *et al.* (2010) in *Coyote's Guide* that maps are orienting tools that, over time, reflect spatial realities with increasing accuracy. Given the ages of the children in my

class, I did not expect that their maps would accurately reflect the spatial realities of the forest. Instead, I anticipated the children would focus primarily on their own movements. This expectation was consonant with my overarching goal of understanding the experience of the child, and was a further contributor to my decision to use maps as the tool of inquiry. Overall, it was my hope that in creating these maps, children would begin to assemble what McCann calls “a common image of shared experience,” (2014, p. 20).

### **Participatory Methods/Offer Insight into Experience**

Participatory methodologies directly involve the subjects of research and the researcher in the creation of a body of evidence that addresses a particular line or lines of inquiry. The Mosaic Approach (Clark & Moss, 2018; Clark, 2007) was the primary methodological inspiration for the current study. This approach seeks to assemble an understanding of children’s experiences through collecting various artifacts and experiences that, taken together, create an informative ‘mosaic’ informed by children’s perspectives. The Mosaic approach is philosophically related to the Reggio Emilia approach (a central aspect of our school program) because of the emphasis it places on the collection of informative data via a variety of channels. In contexts inspired by Reggio Emilia, these channels are often referred to as the “Hundred Languages” (Edwards et al., 1998). Research shows that drawing and mark-making are powerful tools for both meaning-making and garnering perspectives in young children (Einarsdottir, Dockett, and Perry, 2009). Therefore, given the context of our school, the need to travel light, and the ready availability of paper and writing implements, I chose to present languages of visual expression—paper and pen—to the children to create their maps.

## **Materials and Methods**

### **Participants**

The participants in this study were 10 children (9 male, 1 female) between the ages of 3y 1m and 5y 3m. Children had been enrolled at Nature School anywhere from two years to two months. Five of the children attended Nature School for a full day, while five attended for only half. I (the author) was one of two teachers in this classroom. However, my co-teacher taught for only half of the day, meaning that I spent the afternoons with five of the children (the children whose work is represented primarily in the visual artifacts depicted in this work).

### **Materials**

**Paper and Clipboards.** The primary material used to create maps were pieces of white paper. These white papers ranged from sheets of watercolor paper to printer paper—but all were white. Typically, these white pieces of paper were affixed to clipboards, meaning that we could travel lightly on our wanders (e.g., bringing a single clipboard rather than a heavy notebook). I carried all of the materials in a tote bag or backpack in order to allow the children to engage hands-on with the world as we wandered.

**Felt-tip and Ball Point Pens.** Black felt tip pens—referred to as “Teacher Pens”—were the primary writing implements children used during their creation of maps. These felt tip pens, and other ball point pens, were selected with the aim of maintaining the children’s awareness on the rendering they were creating (as opposed, for example, to the color or texture of the writing implement).

### **Invitations to Create Maps**

Over the course of the second half of the school year, I consistently invited children to create maps. This invitation occurred primarily in the second half of the day—once the five children who attended only half days were picked up. However, mapmaking sometimes occurred in the morning. Mapmaking always occurred within the context of our Wanders.

## **Wanders**

Mapmaking always began similarly. I began by inviting the children to “take a wander” through the forest aware that wandering through a natural space has the potential to spark interest and inquiry in a variety of domains. Haas and colleagues in *The Coyote’s Guide to Connecting with Nature* (2010) define “Wander” as an aimless walk through the forest during which children are free to experience and encounter the natural world. In our classroom, each Wander was an invitation that the children could accept or reject; and if the children decided against a Wander we did not go. However, when the children did decide to go on a Wander, we began by gathering the necessary materials. Typically, these included a clipboard, a few pieces of blank white paper, a felt tip pen or two, a roll of tape, and a nature guide (e.g., regional birds, insects, tracks and scat, and mammals). Often the children opted to bring along magnifying glasses or binoculars. Occasionally, we also bought an instant camera. Each of these tools was selected to invite children to take a close look at the world that surrounded them once something caught their eye.

Typically wanders began by defining an end goal—and these came in a few forms, none of which are mutually exclusive. Location-oriented wanders had the goal of arriving at a particular location. Observation-focused wanders were focused on finding examples of a particular plant, creature, or phenomenon—e.g. “I wonder how many birds we will find on our wander today?”. Aimless wanders were taken entirely—and explicitly—for their own sakes. Depending on the sort of wander—*location-oriented, observation-oriented, or aimless—the children decided how to begin—which way on a particular path to go.*

It is important to note, however, that the degree of a child’s participation in any act of the wander varied, and no pieces of a wander were ever compulsory. For example, on a wander that emphasized looking for various sorts of birds, some children declined to look. Some days, the children wanted to document many of the things they saw on a wander. On other days, they preferred to focus primarily on experiencing the wander firsthand.

## **Making Maps**

Most of the maps were created on pieces of blank cream-colored paper that we carried around with us. When the children decided to begin a wander on which we would make a map, the children would start a map wherever we happened to be at that particular moment. Starting points did not always represent our point of disembarkation or origin. When the children would come across something they wanted to add to the map, I handed them the clipboard and a felt tip pen. The children would draw what they saw, and once they were done depicting it visually, I would invite them to write or to dictate any words relating to the subjects they had depicted. Those who could write certain words or letters had options: I could take their dictation as well, they could write their own words, or we could work together to create meaningful text.

On some occasions, tape was also used to add artifacts to the map, such as flower petals, leaves, sticks, bits of mulch, or other pieces of the natural world encountered on the wander. In these moments, too, the children were invited to write or dictate any words and to create marks or accompanying illustrations that they deemed relevant. This process continued until the children decided it was time to transition to a new activity at which time I would verbally confirm that we were finished our wander and map. Once the children all agreed, the map was put away.

## **Storing Maps**

Once created, maps were stored in a half-inch binder. Each map was housed in a clear sheet protector with three rings punched out of either side. This collection came to be known as the “Book of Wanders” as it came to be called, was always with us. Children had the freedom to request maps at any time, to add other artifacts such as pieces of nature to the maps, and to add to any previous maps. We kept the Book of Wanders in a tote bag that I carried into the forest each day.

## Results

Over the course of nearly eight weeks, the children created 10 maps that chronicled their wanderings throughout various areas of the forest. The primary question of this research asked: What will maps reveal about this group of children's experiences of the forest? A second question wondered: How, if at all, would these children use maps to interpret and process their experiences in the forest? Each of these questions will be addressed in turn.

### Children's Use Nature, the Built Environment, Flora and Fauna to Ground Experiences

The children's maps revealed that they positioned themselves within the forest primarily in relation to (1) familiar natural landmarks and (2) features of the built environment. Maps also revealed that children were drawn to familiar flora and fauna. However, children did also include other initially less-familiar items—that, through the map, became familiar. Undergirding each of these was a sense of awe and enthusiasm for the mapmaking process. Tables 1 and 2 detail the particular features of children's maps and the instances of the appearance of each item.

### Children Positioned Themselves in The Forest Nature using Natural Landmarks

Of the 10 maps included in the analysis, seven featured explicitly labelled natural landmarks. For the purposes of this study, natural landmarks are defined as features of the natural world that, in our class, comprised significant positional landmarks (e.g. the Climbing Tree; See **Table 1** for definition of the landmarks in more detail). Natural landmarks were particularly important to children because these were the landmarks used to reference position within the forest in our school culture. For example, a teacher might say "We are having class at the Climbing Tree", in order to refer to the location of their home base. These positional landmarks also helped children navigate their ways to specific locations and through the environment of the forest. For example, indicating that one left an item "near The Fallen Tree" or indicating that one should "turn right at Bob Sycamore" was the common way to refer to position. In their maps, the children demonstrate their internalization of this way of conceptualizing the space of the forest—as a collection of natural landmarks within which they move and between which they encounter features of both the built environment and of flora and fauna.

Table 1  
*Landmarks in the Forest*

Natural Landmarks	Description	Appearances
The Climbing Tree	A large live oak with low branches upon which the children frequently climbed.	1/19
The Clearing	A large, cleared space in the forest with a swing, benches, and a fort made of fallen branches.	1/14; 2/11
The Super Tree	A large fallen tree that was particularly challenging to climb. Far from the path.	1/28
The Fallen Tree	A petrified tree, easy to climb, adjacent to path.	4/6
The Airplane Field	A mowed field where the local model airplane club frequently met to fly planes.	1/14; 1/19; 1/28

### Children Positioned Themselves in The Forest using features of the Built Environment

Given the location of the Forest within a public park that was also an arboretum, the children came into contact daily with features of the environment that were not natural—that is, features created by human beings. These features, such as benches, bridges, docks, and picnic tables, are referred to as "the built environment" and are features in seven of the 10 maps included in the dataset. Similar to the familiar features of the natural environment, these pieces of the built environment also served as important positional markers within our school culture (some, for

example “The Benches” were also classroom sites). The map from 1/12 (Map Jan 12.) in particular illustrates children’s awareness of the built environment. It includes my own representation of the School Bus (our starting point), and the children’s depictions of “The Bridge” and “Bird Blind”. In addition to familiar natural landmarks and features of the built environment, children also depicted flora and fauna in their maps.

**Children Are Drawn to the Flora and Fauna of the Forest**

Eight of the maps include children’s depictions of at least one example of fauna or flora that is not the site of a classroom. Children typically depicted familiar flora and fauna (see Table 2).

Table 2  
*Flora and Fauna*

Examples of Familiar Flora and Fauna	Appearances
Flowers	Wood Sorrels (1/20; 1/25; 4/6) Cana Lilies (1/20)
Trees	Oak (1/11); “With Fungi” (1/11); Cypress (1/12); Palm (1/11, 1/12); Willow (1/12); “Low” (1/19) Palmetto (Jan 25); Sycamore (2/22)
Mushroom	1/28
Snake	4/6
Seed Pod	2/22
Alligator	4/6
Dragonfly	4/6
Butterfly	4/6

Interestingly, of the eight maps that include flora, only one includes fauna (see Figure 1, Map of 4/6). This may have to do with the fact that the majority of the other maps were created during the wintertime, when, at the children’s eye level at least, fewer animals and bugs were immediately visible.

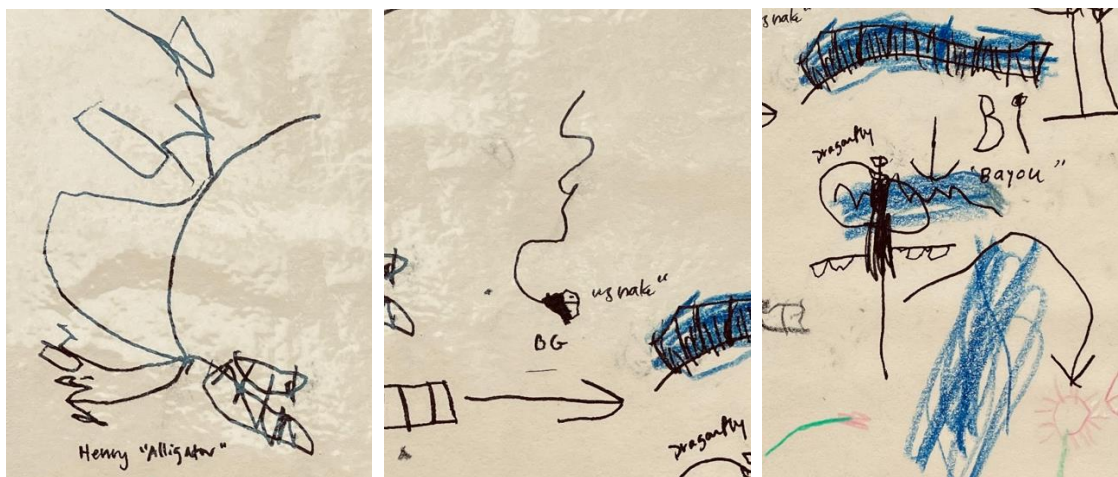


Figure 1: Details of Fauna from Map of 4/6 (Left to Right: Alligator by HE; Snake by BG; Butterfly)

**Other Features Included in Maps**

In addition to the aforementioned natural landmarks, built environmental features, and flora and fauna, children's maps occasionally included other aspects of the environment that did not fall into either of these categories. Animal tracks, rocks, and bunny scat all made at least one appearance in the children's maps. See Figure 2 (Map of Jan 11) for a detailed example.

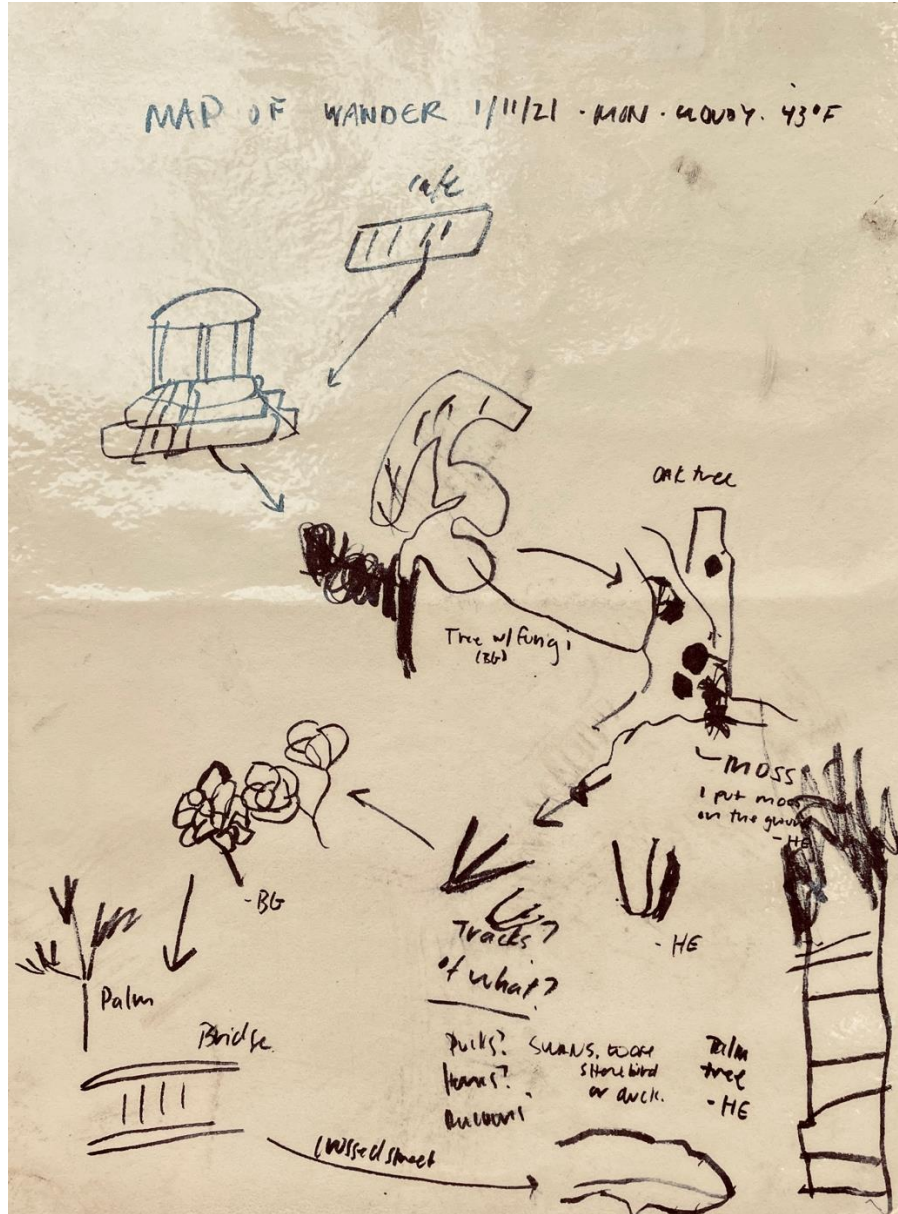


Figure 2: Includes flora, duck tracks, moss, a feature of the built environment. Notably, this is the children's first map (Jan 11).

While the content of children's maps revealed that natural landmarks, the built environment, and flora and fauna figure heavily into children's relationship to the forest there is more to consider. Mapmaking was always a communal process that occurred within the physical space of the forest. As such, making maps was a doubly layered experience that constituted an important memory of itself *and* served as an occasion to process an experience either as it



unfolded or immediately after. What, then, did children’s maps have to say about the ways that they interpreted and processed their perspectives on and experiences within the forest? The data revealed that, for the children in this class, maps were chronological chronicles of their wonder and awe at the world. The data also revealed that the awe and wonder represented in these maps often provided children an opportunity to explore the complex act of the communal construction of knowledge through discussion.

### A Chronological Orientation

While the content of the children’s maps revealed that they positioned themselves primarily in relation to familiar natural landmarks, built environmental features, and used each of these as grounding points between encountering familiar flora and fauna, the children’s maps revealed a deep chronological understanding of themselves within the forest space. Indeed, my hypothesis that children’s maps would be a primarily chronological exploration was supported. Only after many months did children’s representations begin to adopt a spatial perspective.

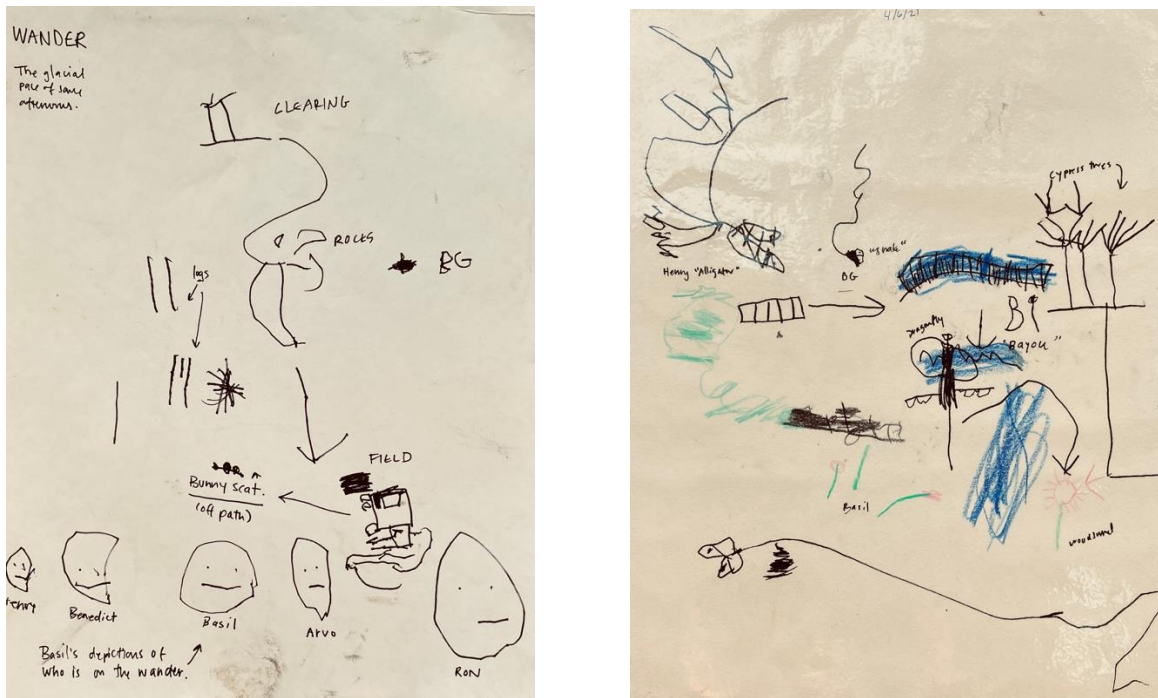


Figure 3: (Left; Map from 1/14/21) Children’s maps began as primarily chronological chronicles of experience. (Right; Map from 4/6/2021) However, after some time, children also experimented with spatially representing their positions within the forest.

For example, in Figure 3, the map from 1/14 begins with a picture of The Clearing (a familiar natural landmark). Next, it proceeds down the page to rocks (connected to the clearing by a long line representing the amble of the children’s path). Proceeding from the rocks is an arrow to The [Airplane] Field. However, there is also a picture of logs drawn adjacent to the rocks. At the bottom of the map is a depiction of all of the participants in the Wander on that day. In contrast, the map from 4/6 experiments with a more accurate spatial representation. This is the only such map that fully attempts to capture the relationship of space on the map—for example, depicting the bridge, cypress trees, and path in proportion to one another and attempting to show aspects of the Forest (e.g., “The Fallen Tree” and “The Loop”) in an accurate spatial relationship. It is important to note that the children’s chronological representations are not deficient, but are instead developmentally appropriate and suggest a priority for their maps that differs from those of adults.

### **Interacting with Maps: Rich Experiences in Communal Knowledge Construction**

An analysis of the children's dictations related to and of their interactions surrounding the creation of the maps revealed that map creation was an occasion to capture wonder and to co-construct knowledge. A few of these instances of discussion are detailed below.

On January 20, (Map from Jan 20; also see Figure 4), the children took a wander that, according to the map and corresponding photos covered only a short distance. Nonetheless, that day provides a rich example of the ways that mapmaking within wanders provided opportunities for children to create knowledge with, challenge assertions put forth by, and transmit knowledge to their peers.

**Beauty and Death.** HE notices Cana Lilies beside the path we are walking on. HE pauses and looks closely at them, deciding to add them to our map. HE then remarks:

*The flower petals, they're pretty. It's kind of dead.*

Here, HE reacts to nature, and verbalizes his experience of two typically contradictory constructs—beauty and death. His friends gather around him and remark on the nature of the lilies—and question whether or not they are really dead. The brown markings on the leaves suggest that they are, indeed, dead. A nearby plant also confirms that the one under initial consideration is especially unhealthy.

**Bunny Scat.** Later, AR, HE, and BK are observing some bunny scat. HE lifts a stick and points to it. AR speaks first.

*AR: They eat carrots, and they poop! Why do bunnies keep pooping?*

*HE: We poop a lot only when we eat food, so maybe they eat food!*

In this exchange, AR implicitly refers to our previous sightings of bunny scat in the forest and wonders why there is so much. HE then attempts to explain this phenomenon by connecting to his own lived experience.

**Pollinating.** The children pause to observe wood sorrels growing at the base of a tree. A bee buzzes around the flowers.

*BG: It's pollinating.*

*HE: That means it's spreading honey to eat, getting a little from its flowers, and heading back to the rest.*

Each of these dictations shows a different aspect of children's experience within a single afternoon of mapmaking. While I was unable to capture the full extent of each of these discussions, these illustrations remain important exemplars of the sorts of experiences the children regularly had with one another.

### **Mapmaking is an Integrative Experience**

Dictations revealed that children were making connections between their observations of physical characteristics of the forest and prior experiences. This supported my hypothesis that maps, for these children, would be rooted in place. Further, it suggests that maps reach across spaces and experiences, providing evidence that mapmaking may constitute an integrative experience for young children in outdoor educational contexts. For example, as early as January 12, the children noted "I think we've been this way before!" (BG). Although the data does not offer enough context to discern the accuracy of BG's statement, it nonetheless illustrates that the act of making maps invites children to reflect on things they have previously experienced.



Figure 4: Scat: 1/20 HE (right) pointing to the bunny scat on the log as AR (left) and BK (center) look on.

### Discussion

**Mapmaking and looking at maps reveal children's relationships to and develop children's relationships with spaces.** In a 2015 paper, McQuarrie and colleagues assert that "nature [is a], setting and resource, afford[ing] flexibility in pedagogical practice and provid[ing] multiple possibilities for children's learning and development." The authors also elaborate many ways that natural settings become part of an emergent curriculum of sorts that structures children's days and experiences within outdoor educational contexts. In place based educational contexts where children are intimately connected to the unique physical and natural features of the world around them, inviting children to reflect on and articulate their relationships to spaces is a critical component of both solidifying pedagogical understanding and the memories that are shown to provide an important base for connection to nature as children grow.

*"I think it's cool and also beautiful," HE notes as we sit in front of a memorial fountain. We then discuss that a memorial fountain means that someone has died and that a fountain was built to honor their memory. In the midst of the fountain is a statue of a water nymph.*

*"I really miss that lady who got died," BG adds, following a few moments of silence. "It could be a girl, or a kid." (January 11, 2021)*

For AR, the newest member of our class, the process of wandering through the forest on a mapmaking expedition led to a moment of important connection.

*As we stop at a point on our wander, a bug finds its way onto a pair of our binoculars. A peer captures the bug in a jar, and it eventually makes its way into AR's hands. He regards the bug and remarks: "It's so cool, I want to keep it as a pet," (January 13, 2021).*

A couple of weeks later, BG pulls out a map of the park before snack time. He and some peers spend some minutes around it.

*"What are you looking at guys?" AR asks.*

*"A map," BG says. "We need to look for arrows."*

*"There's arrows!" AR replies, pointing to the map. HE also points a finger toward the map.*

*"It has every kind of thing you want to see," BG adds, poring over the details.*

*"This could be Cafe du Monde!" BG adds, and AR quickly echoes him.*

It seems that BG understands the park as a large place that "has every kind of thing you want to see." As we spend more time with the map both in this moment and later on this same day, the children's attention shifts to the key. There are labels for parking lots, food and dining services, for stables, and for softball fields to name a few. The children ask me to read each of these in turn, and as we do I point out or proximity to (or emphasize our distance between) each.

**Mapmaking honors the developmental levels of multiple children while giving them a chance to collaborate meaningfully in a shared artifact.** In a classroom filled with only four-year-olds or one where the children range in age from barely three to nearly six, there are different strengths, interests, and capacities. One of the beauties of shared mapmaking is that children are invited to participate as much or as little, and in whatever way they feel most comfortable. On some days, children want to dictate, on others they prefer to draw a contribution. Sometimes, they want to write arrows, or merely describe the weather outside. Each 'language' (Edwards, Forman & Fyfe, 1998) of expression is valuable and contributes to the ongoing work we are conducting as our class embarks upon a shared experience (see Helm & Katz, 2011).

*"Would you like to draw the people who are on the hike?" I ask BK (3y 9m) eager to give her an opportunity to participate in creating this chronicle of experience. She readily agrees, setting to work drawing each of the people on the hike. She starts with me, adds herself, and then the three other children on the hike.*

BK's contribution was as important, informative about the experience, and valuable for our ongoing recollection as any of the landmarks her peers decided to add. Further, her contribution is honored as a piece of the official artifact her peers created (January 14, 2021).

*"I don't know how to draw it," BK would often say, reluctant to visually depict particular stops on our hike. However, when looking at maps together, she was willing to share perspectives verbally. "It was all yellow--they painted!" BK said, in reference to a fence where we began our wander (January 13, 2021).*

Not only are maps shared artifacts reflecting the children's different developmental levels with regard to mark making but they are also artifacts of the children's culture. According to Corsaro (2016) children's peer cultures are rooted in desires to wrest control from adults. In creating and dictating a map and its words, children are exerting power and influence over the physical environment and its officially documented public memory.

**Maps provide an important catalyst for ongoing inquiry and reinforce previous experiences while integrating domains of learning.** More often than not, as we travelled along our wanders, the children posed questions about the spaces we moved through and things we saw along the way. Other times, I invited questions designed to provoke curiosity, evaluate their knowledge, and encourage discussion and reflection. For example, on January 11 as we walked along the path, BG and HE noticed and drew tracks we saw in the mud. As they drew them, they also put their fingers in them, knelt down to get close to them, and wondered aloud what animals might have made the tracks. This multisensory experience was further aided by our use of field guides and our physical proximity to the waterfowl. These inquiry-based learning experiences, where children generate and answer questions collaboratively and with the help of multiple arenas of input, draw from and contribute to children's intrinsic motivation and dispositions toward focused work (Harris, Helm, & Katz, 2011; Stacey, 2018).

### Conclusion

While educators ought to value children's perceptions of the world and of their places within it, coming to a true understanding of how children see things is a complex and multilayered process. In schools where curriculum is primarily emergent or child-centered, it is even more critical that adults responsible for guiding and supporting children have keen insight into the ways that children are constructing and creating knowledge. In this case study, I sought to integrate these two necessities through encouraging the children to create maps. This research adds to the established knowledge base on the potential of maps to provide rich insights into children's experience and to constitute an accessible and reliable way for children to share their experiences with the world.

Future research would do well to investigate ways that educators can transform experiences with maps such that maps become useful to children beyond the instance of creation. In environmental educational contexts where process-oriented approaches to young children's work are consonant established practices and pedagogies, using child-created maps extends the duration of a child's process with their created work. Children transition from the process of creating to the process of revisiting, revising, and extending knowledge. This, in turn, might further solidify their ownership of the knowledge construction-process. Future work might also seek out ways to incorporate maps more centrally into other parts of the day such as whole class meetings or on subsequent wanders where children use a child-created map to navigate to a particular location or recall a particular experience.

Maps were, this study revealed, a powerful stimulus for discussions about the natural world and promoted children's connections across time, place, and experience. As educators seek to explore mapmaking as a tool for reflecting on and reinforcing unfolding experiences, it is important to note that contextual features will play a large role in the particularities of its instantiation. For example, factors such as the time they have to dedicate to this experience, the affordances of their physical natural space (including the flora and fauna present and their relationship with the administrators of the space), and the interests of the children in their care will all determine what mapmaking looks like in a particular context. Nonetheless, when created with care, intention, and patience, they are also powerful records of children's abilities, inquiries, and experiences—and as such are potentially robust tools for ongoing, organic assessment, pedagogical documentation, and for those who wish to advocate for children's presence within natural spaces.

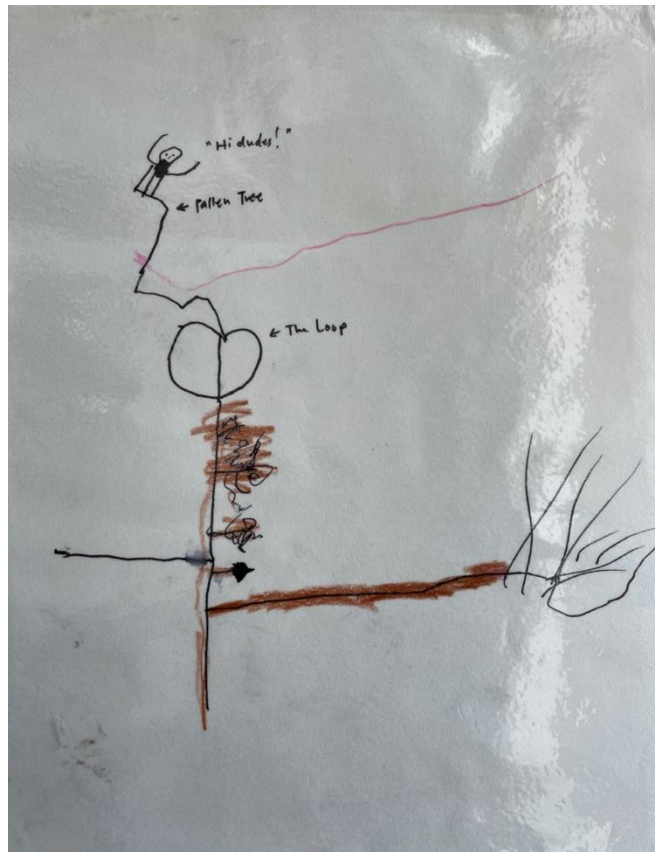
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### Appendices and Figures

#### Map from 04/06/2021.

Note the children's inclusion of creatures, such as the alligator, snakes, and even themselves. As a map created in April, rather than in January, this map is more attuned to spatial relationships of various locations in the forest—for example, the directional arrows and the path in the map on the left that has particular branches leading to specific areas of the forest. It also reflects a refined level of fine motor and artistic skill.



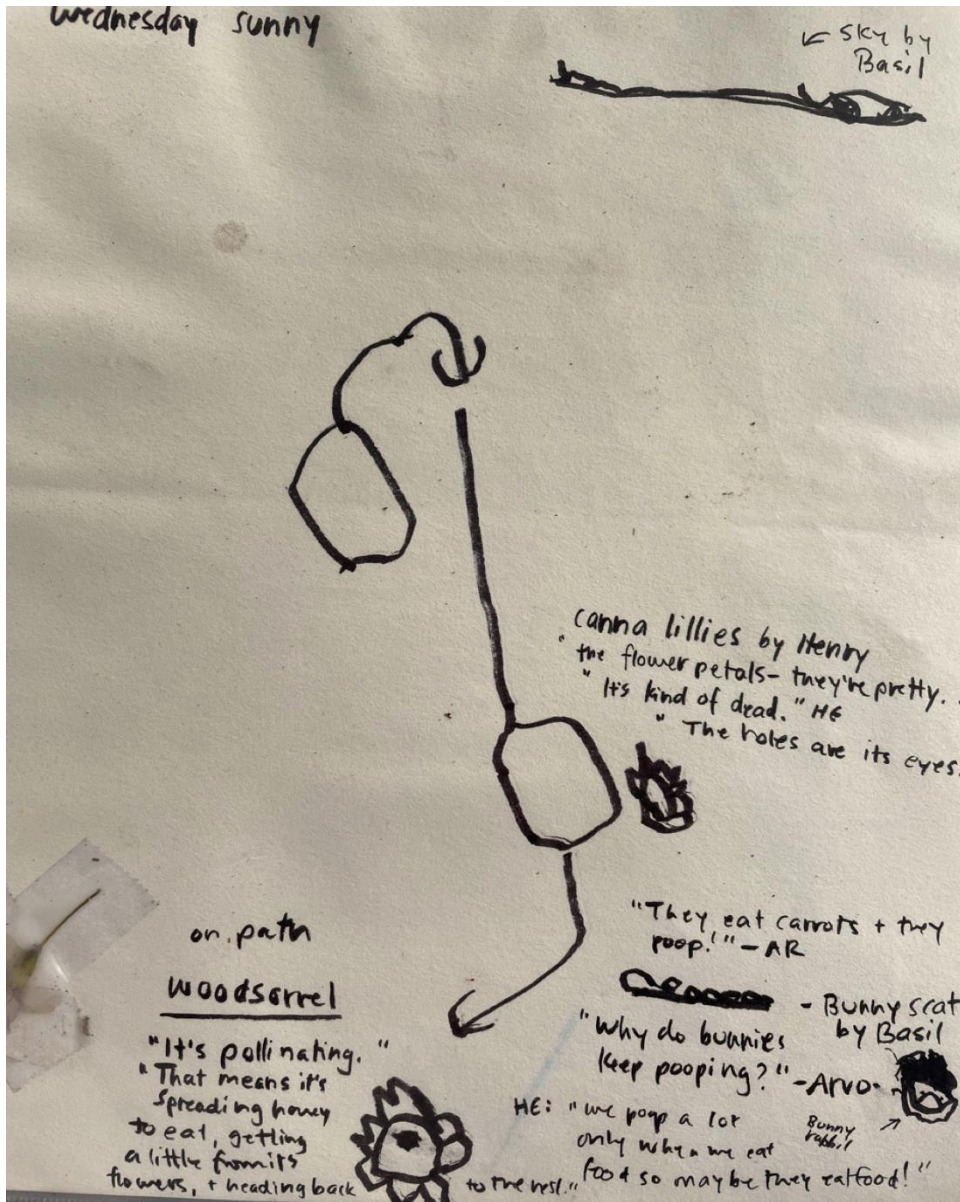
**Map from 01/20/21.**

This map captures some of the children's discussions. Particularly notable are their attempts to define pollination, and the connection between the observed bunny droppings and their own personal experience:

AR: "Why do bunnies keep pooping?"

HE: "We poop a lot only when we eat food—so maybe they eat food!"

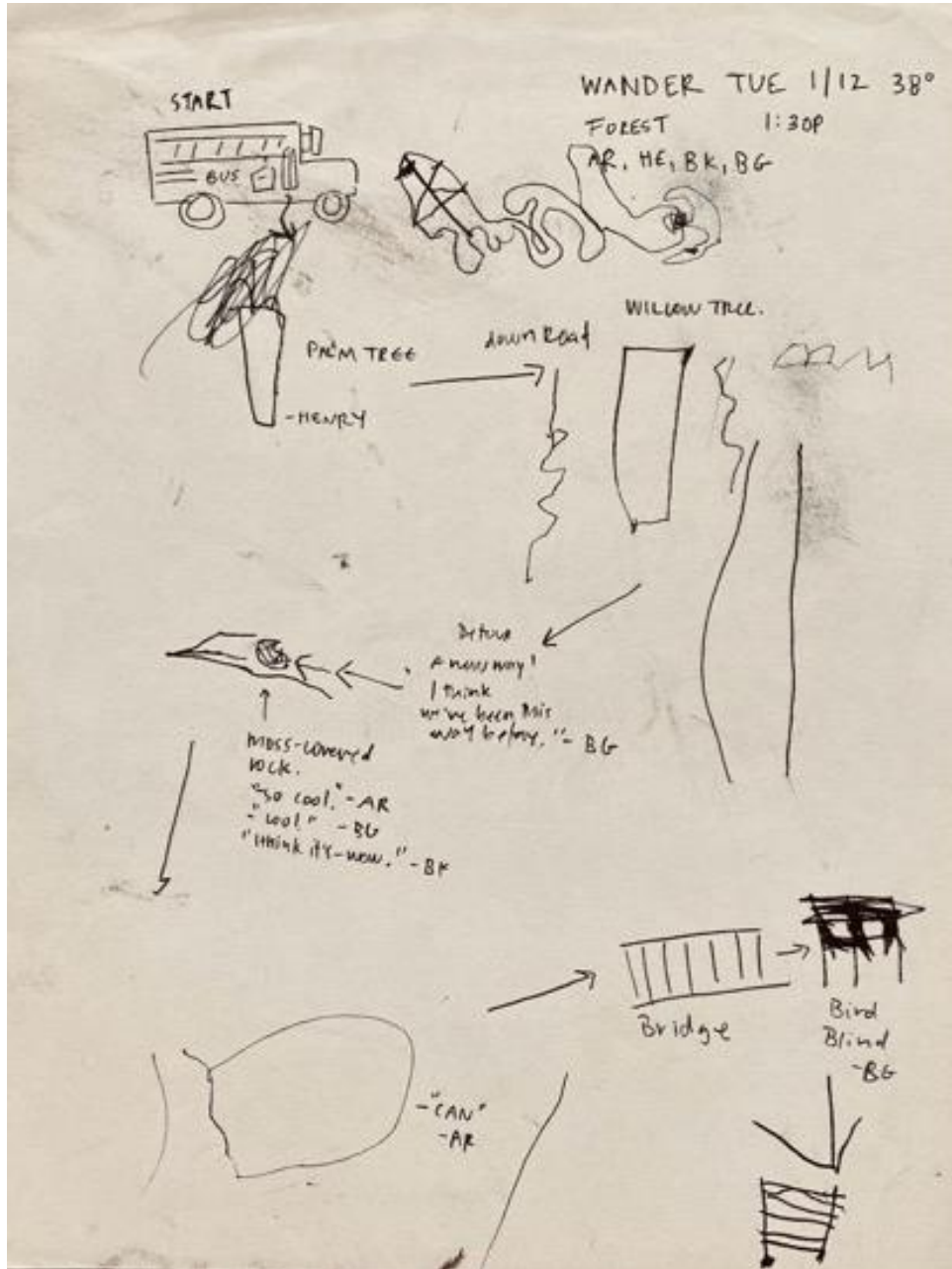
Despite the brevity of this wander, it contains important examples of the processes of knowledge construction, challenging, and transmission that occurred during mapmaking.





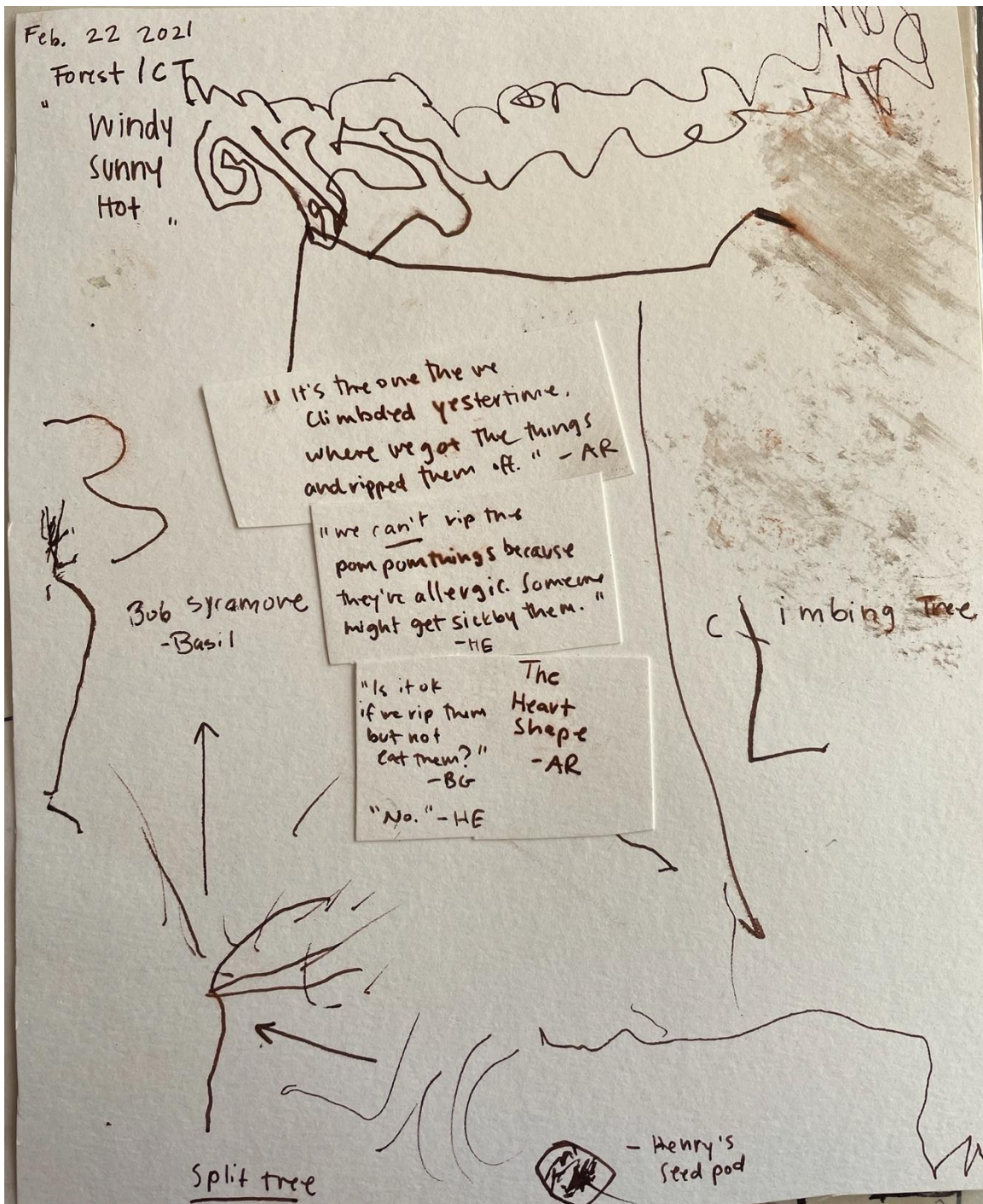
**Map from 01/12/2021**

Map detailing Wander of January 12. Of particular note is the lack of spatial coherence, the presence of flora (e.g., the pam tree) alongside aspects of the built environment (the bridge the road, and a can), The drawing of the bus (top left, underneath "START") was done by the children's teacher to start the mapmaking process.



Map from 02/22/21.

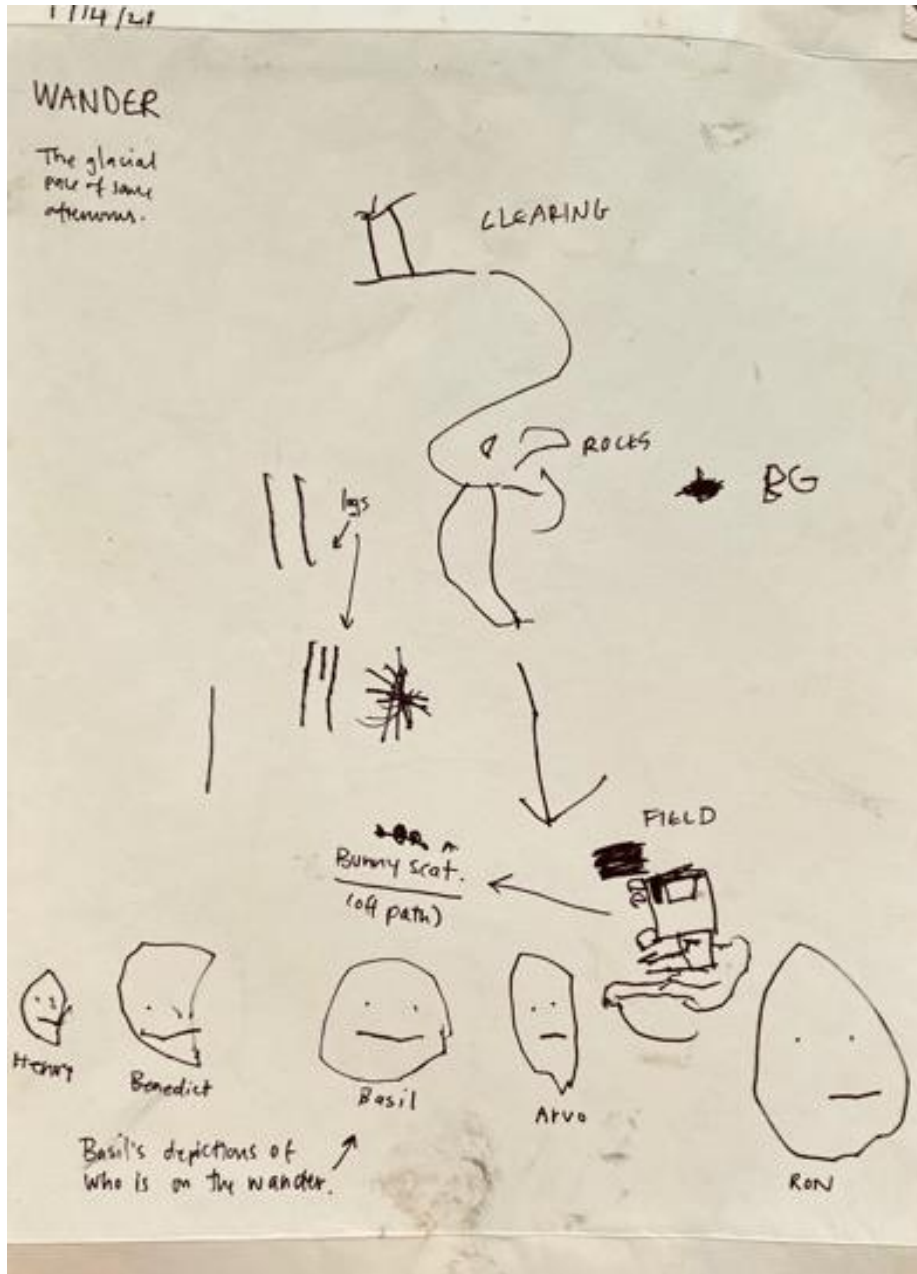
This map incorporates elements of the children's reasoning about the propriety and safety of touching and/or eating a particular part of a plant. It also includes their renderings of familiar locations in the forest.



**Map from 01/14/2021**

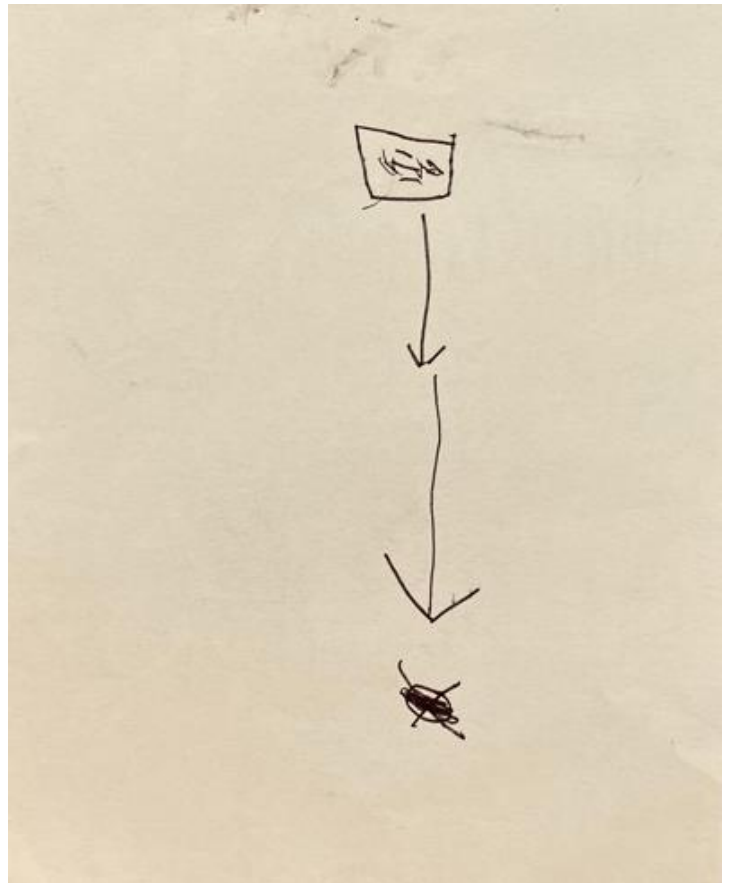
Notable because in this early phase of mapmaking the teacher's dictations are necessary to interpret the children's meanings (as opposed, for example, to the Map from 4/6/2021). Also includes depictions of the children on the wander—one of only two maps (the other being 4/6) to do so.

Note researcher's reflection "The glacial pace of the afternoons,".



**Map from 02/01/2021**

*This map is an important example of a sparse map that the children created. Some maps included sparse details and only snippets from the children's interactions. Importantly, a sparse map does not necessarily correlate with a short wander or a lack of engagement. Young children's products, while informative, are only one aspect of a broader process that is constantly unfolding.*





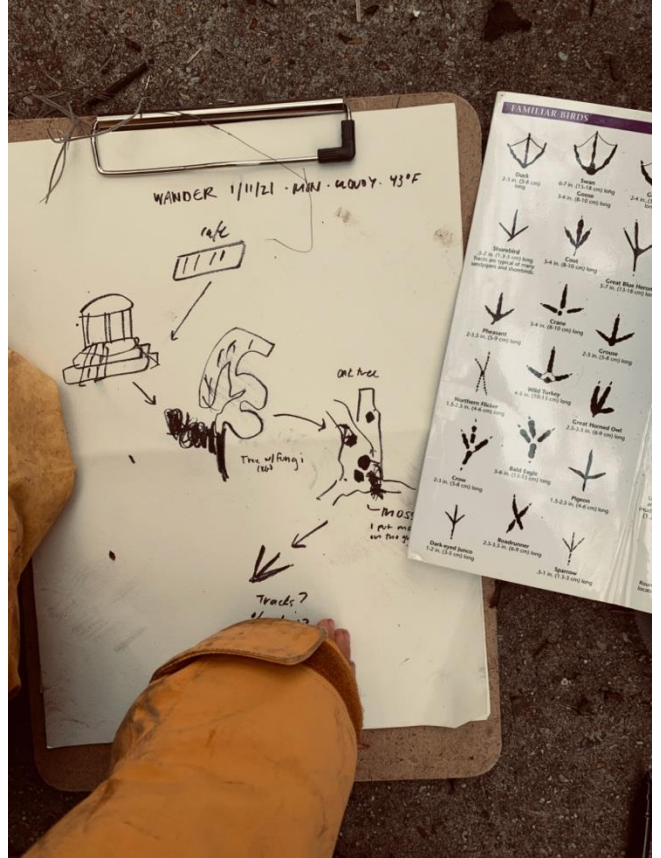
Top: AR adds a detail to a map on January 12.



Bottom: HE adds detail to a map on January 20.



Top Left: The children trace their trajectory on the wander.  
Top Right: A detail of the children at work identifying the tracks using a field guide.



Bottom Left: BG draws a detail on a map.  
Bottom Right: Goose tracks in the mud.



Top: BG shares a map (from January 11) with his peers on January 26.  
Bottom: HE adds a detail to a map in the afternoon on February 1.



**A Map of the Arboretum**

Retrieved from: [https://neworleanscitypark.com/files/in-the-park/couturie\\_forest\\_map.pdf](https://neworleanscitypark.com/files/in-the-park/couturie_forest_map.pdf) (12.28.2021)





## **Urgency, Equity, and Agency: An Assemblage of Global Concerns and Interests in Early Childhood Education for Sustainability**

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### **ABSTRACT**

Global environmental changes and substantial social justice issues are impacting all, raising significant concerns for the Earth's future. There is a need for equitable education as an avenue towards addressing these sustainability challenges. This qualitative content analysis study examined a representation of the concerns and interests of professionals involved in early childhood education for sustainability (ECEfS). We analyzed a conference document collated for the Transnational Dialogues in Early Childhood Education for Sustainability Research (TND) that included contributions from 60 educators and researchers from nineteen different countries. Three significant global and interrelated ECEfS themes emerged from the data: urgency, equity, and agency. The data indicate an urgent need for change as well as a much-needed push for equity alongside stakeholder concerns and interests in the role of children's agency. There was evidence of an inherent tension between child-centered and more teacher-centered pedagogies to achieve specific education for sustainability (EfS) goals. The findings have implications for applied EfS practices, co-operative research, and future investigations on a global scale.

**Keywords:** early childhood education for sustainability, environmental education, education for sustainable development

In a world that is rapidly changing, education has a significant role in responding to population surges, human migration, depletion of finite resources, and climate change (Roberts, 2015). These global changes impact all of humanity, requiring nations to work together in addressing these worldwide concerns (IPCC, 2021). Beyond the impact of environmental issues, there exist substantial social justice and human rights matters that require collaboration between professional associations, educators, and academic scholars (Elliott et al., 2020a). The United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2016) recognizes the need for the implementation of sustainable development through "inclusive and equitable quality education and lifelong learning for all" (p. 3). Students must be prepared for the present and the future to address worldwide problems, such as environmental destruction, disease, and inequity (The International Commission on the Futures of Education, 2021). Now, more than ever, it is important for educational stakeholders from around the world to recognize other's varied perceptions and research regarding education for sustainability (EfS) to effectively collaborate and address global changes.

The focus of this qualitative study was the document analysis of a conference BioBook collated for the Transnational Dialogues in Early Childhood Education for Sustainability Research (TND) in 2020. The BioBook offers a representation of concerns and interests from sixty participating educators and researchers around the world involved with early childhood education for sustainability (ECEfS), thus generating a potential starting point for

collaboration within the field. The possible implications of this analysis are far-reaching, including applied EFS practices, cooperative research, future investigations, and changes to benefit all.

### Education for Sustainability

The definition of sustainability is murky and unclear within the literature. In fact, there have been ongoing international deliberations regarding the terminology surrounding sustainability, as well as its related vocabulary and application (McKeown & Hopkins, 2003). According to various models, sustainability is often conceived within the context of four dimensions – economic, social, cultural, and ecological – although some add a fifth dimension by including the political realm (UNESCO, n.d.). EFS involves the interpretation and implementation of sustainability concepts within an educational setting. Davis (2014) offers a broad outline of EFS as “creating changes in how we think, teach, and learn” (p. 22), a vision aligned with earlier perceptions of EFS as way of thinking (Bonnett, 2002). EFS includes UNESCO’s dimensions of sustainability as integral to the cultivation of the skills and knowledge needed for children to make informed decisions and take appropriate actions (The International Commission on the Futures of Education, 2021).

Over time, various terms have been employed around the implementation of sustainability in educational contexts, and some scholars have previously debated the terms EFS and ESD. For example, McKeown and Hopkins (2003) proposed an interchangeability of terms, yet Bonnett (2002) argued that sustainable development directly contrasts to the conservation of living things and shared concerns about the concept of development as often approached within the framework of Western cultures. Most recently, Williams (2021) has explored the intersections of majority western white countries and climate change, to coin the term ‘climate privilege’. Those who are climate privileged are untroubled by climate change, perceive it as an environmental problem only, and have the means to address any negative personal impacts. The cultural context in which terminology is used can also blur understandings and introduce various nuances. For instance, Nordic countries typically relate EFS to ideas of justice and democracy, whereas other countries, like Japan, traditionally associate early childhood EFS with nature-based environmental activities (Elliott et al., 2020b; Hagglund & Johansson, 2014). Many European studies employ *education for sustainable development (ESD)* or incorporate a global developmental aspect of learning into the consideration of EFS (Hedefalk et al., 2014). Within the United States, the term EFS is not as frequently used as the related term, *environmental education*, even though the former has a more extensive meaning (Carr & Pleyak, 2020). In this study, we employ the more widely accepted term *education for sustainability* to indicate an inclusion of complex social issues closely linked to the physical environment (The International Commission on the Futures of Education, 2021) and because it best aligns with the document analyzed.

Although EFS might appear differently when represented in each country based on a diversity of cultural and social contexts, there are “currently pervasive multidimensional injustices globally across time, majority and minority worlds, and species” (Elliott et al., 2020b, p. 54). Thus, a framework for EFS should include the multiple dimensions of sustainability mentioned earlier – economic, social, cultural, ecological and political – in an interdisciplinary way. UNESCO (2016) reiterates this holistic approach to EFS by emphasizing the multifaceted elements of human existence. While early childhood education research has traditionally explored children spending time engaged *in* the environment via outdoor play, only over the last decade has there been a shift towards inquiry into children learning *about* and *for* the environment through a sustainability lens (Davis, 2009). EFS within early childhood education has rapidly expanded since 2009, leading to a growth in the literature foundation as researchers and practitioners alike begin to see the importance of investing in young children (Ardoin & Bowers, 2020; Davis & Elliott, 2014; Elliott et al. 2020; Hedefalk et al., 2014; Somerville & Williams, 2015). Early childhood education has a great capacity to contribute to the field of EFS, and the pedagogical foundations of this stage of life require significant support (The International Commission on the Futures of Education, 2021). By integrating EFS into early childhood, young children have the opportunity to form pro-environmental knowledge and behaviors that contribute towards their active role for a sustainable world (Yildiz et al., 2020). This study focuses specifically on ECEFS, acknowledging that education and care for the earth begin at early childhood (European Commission, 2022).

## **A Global Perspective**

Despite a solid literature foundation around international education and globalization, there are contested concepts and terms within the field (MacNaughton & Peter, 2015; UNESCO, 2014), similar to that of Efs. Globalization is defined as a perceived shrinking of distances, resulting in narrowing spaces that had previously separated human activities around the globe (Goodwin, 2019). It has led to the inextricable entwinement of humankind, with people's lives interweaving with those from around the world through multiple networks (Goodwin, 2019). The Covid-19 pandemic has further reiterated the interconnections between human societies and the environment, pointing towards the critical role that education plays (European Commission, 2022). Globalization means the challenges that would once only affect a small region are now affecting communities across the globe (Zhao, 2010).

In light of globalization, Efs issues including human rights and intergenerational equity are increasingly impacting across the world (UNICEF, 2021; Visnjic-Jevtic et al., 2021). In particular, Wang et al. (2011) characterize the need to develop global citizens as active participants who are attentive to diverse social and political interests. Global citizenship involves belonging and identity – a connectedness which prompts concern and consideration for future others (Hagglund & Johansson, 2014). Also, UNICEF (2013) incorporates ideas of solidarity in their definition of global citizenship, recognizing the interconnectedness of human beings and the need for collective positive action. According to Zhao (2010), global citizenship involves modeling cultural sensitivity, teaching about sustainability issues, and engaging students in activities that demonstrate the interdependence of the world and prepare them to potentially deal with global issues. Tate (2012) pushes against employing the term “global citizen” and instead reiterates the essential purposes in international education as “global understanding, global commitment, and global engagement” (p. 208). Regardless of the precise term, it is important for students and educators alike to realize that they are, indeed, members of the planet's cohort and have shared responsibilities to care for the Earth and the people who live in it, as well as restore and regenerate all species both now and in the future.

## **A Global-Efs Worldview**

Historically, global education and Efs advocates have engaged in a conceptual debate based on perceptions of integration, primary purposes, and underlying funding issues (Scheunpflug & Asbrand, 2006). Within contemporary Efs literature, there is a juxtaposition between local environments and issues compared to global settings. Certain approaches to Efs, such as place-based education, demonstrate a tension between localized learning and a more cosmopolitan perspective of worldwide interconnection (Greenwood, 2013). Place-based education is best characterized by the local community and environment being a context for authentic, experiential outdoor learning (Dolan, 2016). Yet according to Greenwood (2013), place-based education as a movement has gone global, moving beyond a sole focus on local place, and towards a global mindset that acknowledges a changing world. “In addition to being multinational, the movement for place-consciousness is also complexly multicultural and extraregional, as its development is always shaped by unique vernacular cultures, and sometimes by cultures in conflict” (Greenwood, 2013, p. 452). Others see beyond the local vs global tensions and acknowledge a continuum of local/global identities and education curricular foci (UNESCO, 2014).

The field of global education shares similar goals with Efs, including social justice, environmental concerns, community relations, and both local/global events. For example, the UNESCO (2013; 2014) documents regarding global citizenship education indicate a strong overlap between key thematic areas and the Efs dimensions. For instance, Tawil's (2013) early UNESCO working paper on global citizenship mentioned economic, social, environmental, and political changes and concerns numerous times, and even included sustainable management (and development) as a single issue. The subsequent UNESCO (2014) document approaches global citizenship education from a holistic perspective, once again describing and outlining the same five dimensions of Efs from a curricular approach. The one component that global citizenship education seems to address, beyond Efs, is that of intercultural issues, such as diversity, world heritage, and languages (Tawil, 2013). However, within the Efs literature there are hints of these concepts, particularly Indigenous ways of knowing (Stapleton, 2020). Because of their shared values, a collaboration between global citizenship education and Efs could strengthen both fields to tackle practical challenges, reinforce research and conceptual frameworks, and reach a broader societal spectrum.

Within the field of early childhood education, there are two published texts that have acknowledged and represented an authentic synthesis between Efs and globalization, both the result of collaborative efforts among researchers from around the world. *Research in Early Childhood Education for Sustainability: International Perspectives and Provocations* (Davis & Elliott, 2014) and more recently a second volume, *Researching Early Childhood Education for Sustainability: Challenging Assumptions and Orthodoxies* (Elliott et al., 2020a). These research focused texts include contributions from authors representing many diverse countries and cultures and most were participants in the TND network. As an international network outcome, these books highlight the possibilities when ECEfs researchers cultivate a whole-planet mindset and a global perspective dedicated to ECEfs. There are numerous challenges facing both global education and Efs that we argue can be better addressed through collaboration between these fields. Thus, we approach this exploration from a global-Efs worldview, seeking to understand the concerns and interests of professionals within the field, specifically the TND network participants in the fifth international gathering (TND5). In this way, we propose to more generally augment collaboration within the Efs community across the world and shed light on the global Efs perspectives, particularly across diverse countries. The following research questions led this investigation:

1. *How do the TND5 participants describe their concerns and interests regarding young children and addressing the social/emotional/political/environmental dimensions of sustainability?*
2. *What are the patterns of commonality presented in the TND5 BioBook across multiple countries and which concerns/interests are country-specific?*

### **Theoretical Framing and Methodology**

Our primary study purpose was to examine how ECEfs stakeholders perceived their world within the context of sustainability. More specifically, we were interested in the stated concerns and interests of ECEfs professionals, highly subjective and individual matters. We acknowledge a social constructivist theoretical framing as our epistemological stance, viewing reality as dependent upon individual human meanings and practices that arise out of interactions and social contexts (Crotty, 2015). To this end, a qualitative content analysis methodology (Bengtsson, 2016) was a relevant way to explore these constructed realities, one not easily deduced by numbers or statistical analysis. For this study, we were interested in the inner states of human activity and learning about how people interpret their experiences as stated in the TND5 BioBook document.

### **Study Background**

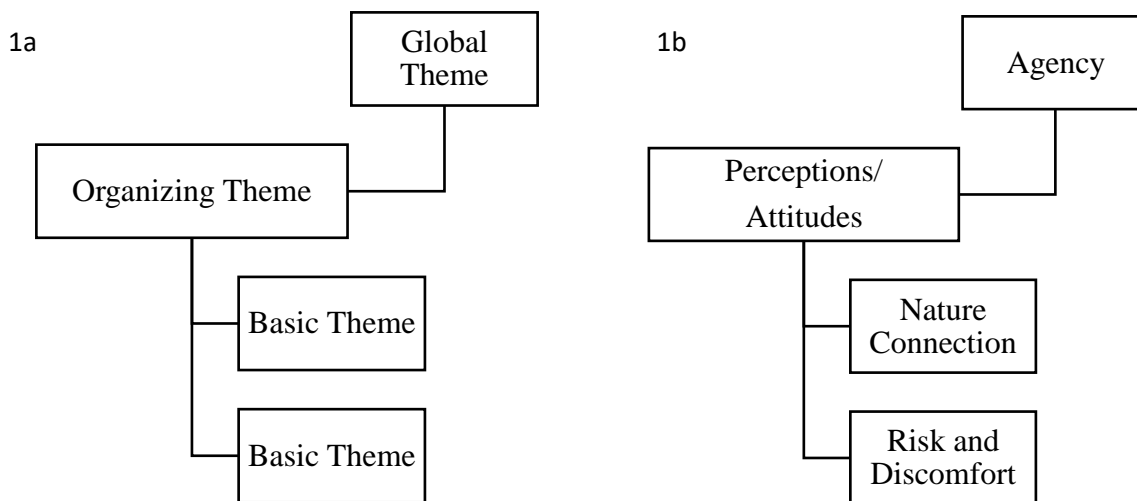
TND is an international participatory network dedicated to exploring and sharing research based on the premise that children can be active participants in transformative change for global sustainability (Elliott et al., 2020a). The TND gatherings have been occurring since 2010 and tend to attract participants with teaching or research interests in early childhood education and/or environmental sustainability. In the fall of 2020, the fifth gathering took place virtually for the first time and involved sixty participants from around the world. Weeks before the virtual meeting, participants were invited to contribute to a Participant Information Guide, or BioBook, sharing some background information and responding to various prompts. In summary, the TND5 BioBook was a compilation of ECEfs stakeholder perspectives on the field of sustainability, specifically within early childhood education. Although the TND5 BioBook was the sole data source for this study, it offered an interesting and cross-world view from professionals representing nineteen countries across five continents. The lead author specifically chose to analyze content relating to only one of the TND5 BioBook prompts: "What are you concerned about or interested in regarding young children and social/emotional/political/environmental sustainability?" Although this prompt included a multi-dimensional view of sustainability, we considered that it could provide a snapshot of how Efs was viewed by a self-selected group of professionals from around the world who prioritized children's futures. The prompt informed the framing of the previously stated research questions.

## Data Analysis

The lead author employed a data analysis technique outlined by Attride-Stirling (2001) using thematic networks – web-like illustrations – to summarize key content themes within a given text. According to Attride-Stirling (2001), thematic analyses are applied when a researcher is attempting to uncover salient themes at various levels and represent these themes in a structured way. Attride-Stirling’s (2001) step-by-step guide provided valuable descriptions of analysis stages that involved a reduction, exploration, and then integration of the text. Rather than use a computer analysis program, she chose to hand copy code the data with colored pens and sticky notes to create a tangible web, or thematic network. Before beginning the data analysis process, the answers to the chosen prompt from the TND5 BioBook were extracted and arranged based on country in a separate chart. The lead author also removed all participant names during this process, so we would be working only with country and the response data.

After organizing the data, the analysis process was commenced by devising a coding framework seeking frequently mentioned ideas or words within the data. Next, she dissected the text by applying these codes to the entire document, making note of overlaps and sections that did not initially appear to fit into any code so we could address them later. As Attride-Stirling (2001) posits, “it is imperative that it [the first step] be completed with great rigour and attention to detail.” (p. 391). Thus, the lead author sought to invest an abundance of attention and time into this first step of coding the documented material.

Next, themes were abstracted, starting with rereading the coded segments. These were refined as needed, striking a balance between being adequately specific, but also sufficiently broad. Networks were constructed by beginning with basic themes, moving into organizing themes, and then ending with overriding global themes. Figure 1a illustrates the levels of themes employed within the technique prescribed by Attride-Stirling (2001) as well as an example from this study (Figure 1b).



**Figure 1a:** Attride-Stirling’s (2001) Thematic Network Structure and **Figure 1b:** Example from Study

Throughout the process of creating the thematic network, a large surface was helpful in illustrating the web-like formation. This hands-on process easily allowed the lead author to rethink sections that did not initially appear to fit into any code and then reworking the network to accommodate them. In writing, we have together described the network, explored it for underlying patterns not already discovered, and produced a comprehensive summary. The final step in Attride-Stirling’s (2001) data analysis technique involves interpreting patterns, as addressed in the Findings section below.

## Considerations

The lead author was a new participant in the TND community in 2020 with a unique perspective, compared to the second author as a past TND participant. Potentially a limitation, due to closeness to the study context, but perhaps an advantage for the lead author was a newcomer and possibly able to see data nuances that long-standing participants might miss. The second author did not take on an analysis role but offered TND insights and facilitated the authorship by the lead author. Both author entries were included in the TND5 BioBook and coded along with the rest of the participants while bridling understandings. According to Dahlberg (2006), bridling involves remaining open with restrained pre-understandings and consistently tending to personal perceptions throughout the study duration. Once the lead author BioBook entry was collected alongside those of other participants', she found it easy to consider in her analysis as part of the data as a whole. None of the direct TND5 BioBook quotations listed within the findings relate to the lead author.

The data used in this study were a convenience sample of the professionals who contributed to the TND5 BioBook, a representation of only a portion of the ECEfS or broader EfS international community. Because the ECEfS research community is close-knit and still relatively small, some of the TND5 BioBook entries were from contributing authors to the two aforementioned texts and significantly informed the literature review. Rather than identify this as a limitation, we posit that this is an example of an epistemic culture in which knowledge is actively constructed by those who work within ECEfS and develop specific practices and mechanisms related to ways of knowing within the field (see Knorr-Cetina, 1999).

After gathering the responses to one specific prompt within the TND5 BioBook, the lead author noticed that, on four occasions, one portion of the text used the exact same words as another individual. Because the TND5 BioBook was collected in stages, it is possible that some of those within the TND community copied and pasted responses to prompts that they felt were similarly applicable to their own concerns and interests. Thus, another consideration of this study is the possibility that the wording was possibly based on a preconceived group norm; some participants' responses may have been influenced by other's, resulting in a more cohesive group norm. According to Smith and Louis (2009), social identity within a particular group can lead members to bring their own attitudes and behavior in line with the perceived group standards. In the case of the TND5 BioBook, this may have led to exact replication of wording for some prompt responses. Since communities are typically impacted by group perceptions and affected by others' opinions over time, we argue this is not a strong limitation.

## Findings

Three significant global and interrelated ECEfS themes emerged from the data: urgency, equity, and agency. Many of the lower-tier organizing themes or basic themes exhibited overlaps across these three global themes. For example, the organizing theme of *teacher education* related to both equity and agency. While later exploring the constructed analysis network, the lead author recognized more connections between ideas, resulting in a rather complex illustration with many associating lines. Within these findings, a summary is provided of the underlying patterns discovered, as well as a detailed interpretation. Although each of the global themes is discussed separately – urgency, equity, and agency – it is important to note that these are not simple or isolated concepts. The patterns and ideas that emerged within this study are an assemblage of meanings connected deeply throughout the network. Also highlighted are the organizing themes that either exhibited high frequency within the data or were deemed crucial to the overarching global themes. In the conclusion to this paper, we discuss a tension apparent throughout the TND5 BioBook, and what this might mean for the future of ECEfS.

### Urgency

Within the TND5 BioBook, participating ECEfS stakeholders referenced pressing worldwide or local issues that called for abrupt action. Some used the term *urgent* or *urgency* directly:

Europe 5<sup>1</sup>: There is a new urgency about working towards facilitating change in the Anthropocene, and the human impact on the Earth.

Europe 11: The notion of sustainability is even more urgent in a Covid World

Other participants mentioned Covid-19 as an important issue currently facing the world, highlighting the organizing theme of real-world issues as emergent within the data. Many were concerned with the social disparity and poverty that will indubitably arise from the worldwide upheaval caused by Covid-19. Participants also expressed rising anxiety levels for children as well as physical ailments brought on drought and severe dust storms. Climate change was generally stated as cause for immediate concern, but so were critical issues related to human rights. EFS incorporates more than just ecological issues; it includes an economic, social, and political dimensions as well reflecting the four-dimensional UNESCO sustainable development model (n.d.). A participant from Europe shared their concerns regarding these other dimensions:

Europe 2: I am concerned that the global community does not do enough to fight poverty and that human rights are being violated every day, with children being abused, exploited, and exposed to different forms of violence and human trafficking.

Clearly, there is a need for rapid global change. This sense of urgency was captured by the concerns and interests listed by the TND5 BioBook participants. They mentioned specific real-world issues, such as Covid-19, drought, and human trafficking, all demand calls for urgent action. Others mentioned more generalized issues, like climate change and human rights which are nevertheless just as crucial and necessitate urgent mitigation.

### Equity

As mentioned earlier, the global themes that arose from this study were not isolated ideas, but an interwoven network with complicated connections. The idea of equity cannot be separated from the sense of urgency towards real-world issues facing all species including humankind on a global scale. For example, human poverty and exploitation are inextricably linked with global equity concepts. Climate change and its specific consequences can be felt in very different ways depending on geography, race, and socioeconomic levels, possibly reflecting climate privilege (Williams, 2021). Ideas connected to equity within the TND5 BioBook were far-reaching, many participants explicitly describing equity issues whereas others alluded to the problem of inequities:

North America 6: Working with a commitment to promote anti-racist and decolonial approaches to early years pedagogy and practice, in particular in the area of nature-based education.

South America 1: The intersection between Indigenous and scientific knowledge, to explore new ways to understand complex scenarios like climate change.

The first quote overtly indicates concern about pervasive racism and colonizing practices within EFS (Stapleton, 2020). The second quote, while not as explicit, asserts the participant's desire to bring Indigenous ways of knowing into the traditional Western sciences. Equity may involve challenging ways of thinking or taking direct action towards injustices across the globe. EFS, by very definition, involves a different way of thinking regarding social issues (Davis & Elliott, 2014). Thus, it is not surprising that ECEFS researchers would include addressing equity within the TND5 BioBook when discussing their concerns for young children.

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<sup>1</sup> When referring to the BioBook data, we will denote the speaker's region and his/her randomly assigned number.

## **Policy**

Under equity as the parent category, policy was an organizing theme within the thematic network. Most individuals who referenced policy included a practical application or referred to real-world implications within Efs. A disproportionate number of Australian participants cited policy within their responses, one of the only perceived country-specific themes. Perhaps this was due to the early childhood education and sustainability policy concerns reported within Australia (Elliott et al., 2020b). This particular finding was the only country-specific concern/interest found within the thematic network:

- Oceania 7: Need to keep pushing the ECE [early childhood education] field, policy makers, and general public to understand that sustainability matters have the biggest impact of young children and you and have become urgent.
- Oceania 10: That government agendas can be reframed to focus more intentionally on building stronger EFS foundations in early childhood education.

The first of the above quotes connects back to urgency, demonstrating, once again, the high interconnectivity of the thematic network. It is clear policy plays an important role within Efs and is closely linked to equity. *Who* makes educational decisions? *Whose voices* are being heard within governmental agencies? A key feature of Efs is moving towards a more equitable and just future, and policy has a significant role to play in this undertaking.

## **Agency**

The final global theme that emerged from the data was agency, or the idea that children are active and powerful agents possessing the ability to make their own choices and affect change. Agency indicates they can have influence over and transform their own learning context (Cook-Sather, 2020). Yet beyond the classroom, “student agency is both a condition of a successful society and also one of the outcomes of it.” (Klemencic as cited in Klemencic, 2017, p. 79). The TND5 BioBook data demonstrated that participants perceived agency as closely connected to child-centered learning, an organizational theme that emerged and included children’s skill-development, play, and nature connections. The data suggested that ECEfS researchers from around the world are interested in seeing children engage in active and transformational roles:

- Asia 5: Children’s agency and multiliteracies in a digital world as a part of social and political sustainability.
- Oceania 14: That children are involved genuinely as active and agentic decision-makers.
- North America 1: That children’s voices and agency are important.

The above quotes are only a small representation of the concerns and issues related to agency listed by the BioBook participants. The TND5 BioBook data provide evidence that many individuals internationally within the field of ECEfS are prioritizing children’s agency, albeit some would argue through a post-humanist lens the need for a less anthropocentric view of agency (Weldemariam, 2017). The ideas centered around children’s agentic choice and decision-making abilities can be further elaborated by participants’ perceptions about children as an organizational theme.

## **Participants’ Perceptions About Children’s Worldviews**

Based on the TND5 BioBook data and the thematic network that emerged, practitioner perceptions about children’s worldviews may be significantly connected to Efs and how it is actualized. These connections can be seen in reported children’s worldviews of “their immediate and broader world” (North America 2) as well as children’s “identity and roles... within diverse cultural contexts” (Asia, 1). As part of the BioBook prompt, the TND community responded with interest to how children might perceive the world around them through an economic, social, cultural, ecological, and political sustainability framework:



Asia 6: How does environmental education in early childhood effect his/her perception on the environment and behaviours in his/her later life?

The organizational theme of perceptions goes beyond merely an awareness, and the data excerpt above indicates potentially close connections with children's later behaviors.

In addition to reported children's worldviews, there was some evidence about how teachers perceived the world. How educators perceived EfS and its goals and purposes may also impact how it is actualized. One participant stated that EfS "is a lens or attitude toward life, teachers still ponder how to implement it" (Asia 3). This suggests a potential gap between understandings and practice for teachers.

### **Inherent Tensions**

The three global themes – urgency, equity, and agency – have been discussed and illustrated by direct quotes. Yet how are we to take these three global themes and assemble them? What are the patterns that emerged within this thematic network beyond connecting nodes across the organizational or basic themes? Engaging in the final step of Attride-Stirling's (2001) thematic network analysis involved bringing together the summaries of each network and exploring "significant themes, concepts, patterns and structures that arose in the text" (p. 394). In this step, we returned to our original research questions and constructed tentative responses grounded within the data patterns (Attride-Stirling, 2001).

One significant pattern that emerged within the thematic network was a tension between child-centered and more teacher-centered transmissive pedagogies to achieve specific EfS goals. The data overall indicated an urgent need for change towards child-centered transformative pedagogies reflecting the call by Nxumalo (2017) for educators to pedagogically focus more on shared 'matters of concern' than teaching facts about the world. In addition, we noted a much-needed push for equity alongside participant concerns and interests in the role of children's agency reflecting UNICEF's (2021) current concerns about climate change and children's rights. By definition, agency involves children as decisions-makers (Cook-Sather, 2020), so there are questions regarding the precise pedagogical role of adults in addressing urgent environmental and social concerns with children. For example, considering a child-centered approach as an organizational theme, the TND5 BioBook participants mentioned experiential learning, place-based education, outdoor play, and a community of learners. Yet participants appeared aware of an urgency/equity tension between promptly addressing sustainability and letting children take learning into their own playful hands:

Europe 16: Concerned that pedagogies of play are not usurped by target driven, adult-led curriculums in early childhood education.

North America 4: I am concerned that the approach of using the natural world for open-ended exploration, discovery, and play has been criticized for lacking the transformative power necessary for meaningfully contributing to sustainability issues.

These two separate quotes exemplify the inherent tension that existed between child-centered and more teacher-centered pedagogies with the end goal of transformation. This tension was apparent throughout the data, and there was no evidence of country-specific patterns. especially when reviewing all responses regarding concerns/interests in the TND5 BioBook.

Out of this explicit tension, the question surfaces: What should be our response, as adults involved in ECEfs, seeking to address urgency and equity, while still maintaining children's agency? While we do not believe there is a simple answer, it is clear that some participants have grappled with this question and arrived at tentative resolutions (see Oceania 8 example below). We share three representations of ideas from the TND5 BioBook, offering a continuum of approaches to the tension illustrated in Figure 2.

Oceania 8: Early childhood educators recognise their ethical and moral responsibilities to not only implement EfS, but to be vocal sustainability advocates both with and for young children.

In this case, it appears as if the adults are to take on a great deal of responsibility as well as agency with the hope of implementing the EfS' dimensions. This illustrates the need to advocate for young children, but does not explicitly mention children's ideal role.

Europe 12: That adults take the responsibility for putting sustainability issues on the agenda and are core agents, so that children can sustain their personal resources and can be part of the co-creation of an engaged educational culture.

Another approach to this tension once again places the majority of the responsibility with adults, but offers children roles as co-creators. In this quote, the participant is positing that adults set the agenda, but children have an active role within ECEfS:

Oceania 5: Young children as citizens must be given opportunity to participate in decision making and in taking action, and acknowledged for the contribution they make.

Giving children opportunities to make decisions and take action demonstrates agency and reflects a child-centered approach (Cook-Sather, 2020). This participant (Oceania 5) suggests children can be agents of change if adults offer opportunities and create spaces for their choices.

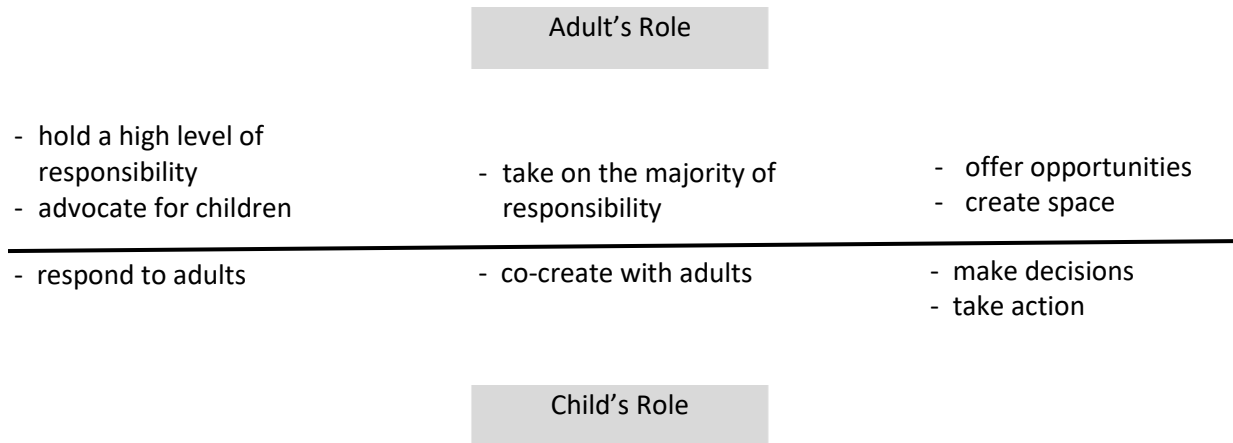


Figure 2: Continuum of Approaches to Inherent Tension

**Implications**

Because current environmental issues are impacting all species including humanity, this study has implications across all sustainability dimensions. The three emergent global themes in this study— urgency, equity, and agency – are important to keep at the forefront of considerations regarding ECEfS and EfS more broadly. These themes represent the concerns and interests of sixty individuals from nineteen countries and five continents around the globe. This content analysis study has showcased the similar professional perceptions about ECEfS, both in research and in practice, despite participants culturally and geographically diverse contexts. There are current ECEfS collaborations around the globe, such as a climate change project in Canada, Australia, and the United States (Nelson & Hodgins, 2020) and historically, the TND network has been collaborating about ECEfS research since 2010, exploring and

sharing investigations within the field (Elliott et al., 2020a). Moving forward, continued collaborative efforts in ECEfS invite professionals to address challenges in research, practice, and theoretical framing.

The similarity of concerns and interests within the TND5 BioBook, points to the importance of ECEfS professionals persisting in working together transnationally to improve the overall understandings and implementation of ECEfS. There were no apparent cultural differences that affect the three themes we found within this study. We suggest that the stated tension between the global themes that emerged can be analyzed collaboratively in hope of growing competencies and strategies regarding the roles of children and teachers in addressing critical worldwide concerns. A variety of perspectives from multiple countries could lead to improved practice, increased support, and overall development in ECEfS.

As mentioned in the literature review, education for global citizenship shares similar goals to EFS, particularly concerning the environment and social justice. Thus, in addition to a collaborative effort within ECEfS, this study elucidates the necessity for an ongoing conversation between global education and ECEfS. UNESCO's (2013; 2014) documents make it clear that global citizenship education is holistic and has significant similarities with ECEfS. The three global themes that emerged from this study are comprehensive and pertinent to all geographical locations. The worldwide relevance of urgency, equity, and agency further demonstrates the shared values of ECEfS and global education. This study coupled with prior literature indicates the overlap in interests and concerns between these oft-separated domains. A collaboration between EFS and global education has the potential to strengthen both fields with far-reaching implications for research, application, and conceptual frameworks.

In this qualitative content analysis study, we sought to analyze the concerns and interests of ECEfS professionals representing multiple countries as a potential starting point for collaboration within the field. The findings have implications for applied EFS practices, co-operative research, and future investigations on a global scale. Global environmental changes are impacting all and raising significant concerns for the Earth's future. Additionally, globalization is affecting human economic, social, and political life, leading to a sense of urgency that is particularly concerning for the younger generations. "For our children to live successfully and peacefully in this globalized world, we need to help them develop the appropriate skills, knowledge, attitudes, and perspectives." (Zhao, 2010, p. 429). Education plays a powerful role in promoting equity and empowering children to be active agents in bringing about positive change. Now, more than ever, it is important for ECEfS professionals to come together, understand worldwide concerns and interests, and collaboratively address environmental issues and global restoration.

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## ***“It’s all over the map”*: A Report on Nature-Based Early Childhood Teacher Preparation Programs in the United States**

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### **ABSTRACT**

In the United States, early childhood programs inclusive of nature experiences for young children vary widely in terms of time spent outdoors; purpose of the program, approaches to use of the environment, curricular aims and support of young children’s development<sup>1</sup>. A commonality across many of these early childhood programs available in the United States is their focus on nature as a context for learning and play, some with an intentional approach to teaching about the environment, and, less commonly, to overtly engage with early childhood education for sustainability (ECEfS). The early childhood years are seen as a critically important time for learning, as well as for development of pro-environment behaviors and dispositions (Chawla & Derr, 2012), underscoring the importance of nature-based early learning.

**Keywords:** nature-based education, early childhood education, teacher preparation, professional development

As reported by the North American Association for Environmental Education (2020), the number of nature-based early childhood education programs has increased twenty-five-fold since 2017. Despite this increase in the number of early childhood education programs with an intentional focus on nature-based learning or sustainability, teacher preparation programs in the United States are slow to meet the demand for skilled professionals with the appropriate disciplinary expertise, or the values and dispositions necessary to engage with issues concerning sustainability and the environment. All of these are thought to be necessary for teachers’ engagement with today’s pressing environmental concerns (Evans, Stevenson, Lasen, Ferreira, & Davis, 2017). A 2021 report published by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) recommended that preservice and inservice teacher preparation programs should support teachers’ development of the knowledge, skills, and pedagogical strategies necessary to effectively address issues of climate and environment in the classroom-at every level of education.

Young children are curious about, invested in, and deeply engaged in questions about the natural world, their future, and their lived experience (Davis & Davis, 2021), yet initial teacher preparation programs in the United States also generally lack an intentional approach to supporting this part of children’s learning and development (Merritt, Archambault, Hale 2018), despite a clear need. While there are great many higher education programs available to those who wish to become early childhood educators, the vast majority of programs, coursework and degrees on offer in the United States are grounded in more “traditional” content, despite growing interest in and support of nature-based approaches to early childhood education. Universities and colleges’ approaches to nature-based early childhood education (NbECE), or education for sustainability (EFS) in teacher education, when present at all, are varied. Typical foci of early childhood teacher education programs focus on child development, academic growth, observation and assessment of young children, as well as health and safety. At this time, the concept of education for sustainability, the environment, and its role in the lives of young children, remains at the margins in

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<sup>1</sup> For a description of some of the major differences and characteristics to nature-based approaches in the United States, see Bailie (2012); Finch and Bailie (2015); Larimore (2016; 2018); and Sobel (2014).

the majority of early childhood teacher preparation programs (Ernst, 2014) in the United States.

In an effort to better understand trends, needs, and the current landscape of nature-based and sustainability-oriented early childhood education (ECE) coursework in higher education settings, a group of individuals (known hereafter as “the survey team”) affiliated with the professional organization Natural Start Alliance/North American Association for Environmental Education constructed a survey in 2017 to gather baseline information related to preservice teacher education in college and university settings around the United States. The ultimate purpose of the survey was to explore *what opportunities exist for professional development and preservice teacher education around nature-based early childhood education* and further, to establish baseline information on the state of NbECE/ECEFS teacher preparation in higher education in the United States, as well as to identify potential areas for advocacy and growth.

The term “nature-based early childhood education” was used in the survey since it more broadly applies to the range of teacher preparation activities identified in the survey. The author acknowledges that there are many differences between *nature-based early childhood education* and *early childhood education for sustainability*, and justification for the language choice follows later in the paper. Results from the survey shaped the direction of a day-long convening at the Natural Start annual conference in New Hampshire in 2019, in order to facilitate exchange of ideas, resources, challenges and opportunities. A facilitated discussion resulted in shared action steps and affinity group formation. This paper shares the results of the preliminary survey.

### **Literature Review and Methodology**

It is widely accepted that Earth’s climate is facing many catastrophic challenges. From ocean acidification to biodiversity loss to deforestation to an increase in extreme weather events, it seems no place on the planet is immune to the effects of climate change. One of the most powerful tools humans have to turn the tide on these impacts is education. As people learn more about their role in climate change and the interdependence of all Earth’s beings and systems, they will be better equipped to compel change in their own behavior, as well as their local communities and beyond. The United Nations, in drafting the Sustainable Development Goals in 2013, acknowledged the importance of Quality Education, naming it the 4th of 17 goals established to ensure a sustainable future for all. The United Nations Framework Convention on Climate Change (UNFCCC) has called for non-governmental and governmental agencies to support education across all sectors, recognizing that a literate citizenry is key to combating climate change and maintaining hopes for a sustainable future.

In addition to acknowledging the need for a populace who is engaged in caring for the Earth and acting on its behalf, educators who respond to young children’s lived experience and questions are engaged in a form of constructivism, which is a common and well-respected approach to early childhood education (ECE) in the United States. Constructivism, an approach used commonly in ECE in the United States recognizes experience as central to learning and development. Some teachers recognize that legions of children across the US are experiencing the effects of climate change even now: through extreme weather events, water scarcity, excessive heat etc. and aim to acknowledge children’s lived experience in ECE settings. Furthermore, many educators are themselves curious about the natural world and the many affordances it offers for play and learning, viewing it as a resource for supporting pedagogical aims (Ernst, 2014).

Early childhood teacher preparation programs vary throughout the United States. Even within states, those individuals wishing to teach young children can choose from a number of higher education pathways: 2 year degrees, known as Associate degrees, or 4 year degrees from private or public institutions. There are also a number of certificates, credentials and endorsements available to those wishing to educate young children. Some programs require additional teaching licenses of their staff. Furthermore, the settings in which early care and education are provided vary greatly as well. Rooted in historical foundations of social care, child welfare and education, early childhood programs often provide full-time or part-time care, and settings can be home-based, located in school districts, community centers, and may be corporate- or privately owned. For this reason, preparation of staff also varies, since even within states, there is some leeway for individual settings to establish their own requirements for training, education, and credentials. Most states have a set of guidelines that dictate what children of a certain age

should know and be able to do by the time they reach kindergarten, which is the first year of compulsory education in the United States. Most children entering Kindergarten are age 5 or 6 years old. In order to work with young children, most educators in the United States must possess some level of higher education. Among the many certifications, credentials, licenses and other documents in the field of early childhood education, there exist a handful of certificates that can be obtained. These certificates generally consist of several to many hours of coursework or training, and may or may not be associated with higher education institutions. Certificates acknowledge the recipient has completed a certain number of courses, hours of training, etc. but these are granted by organizations individually, and while there is an accrediting body that approves academic certificates in some states, many professional development providers grant their own certificates, with little oversight from federal or state education agencies.

In the United States, teachers desiring to work with children aged birth-8 years old have a number of education options for preparation. Many choose to pursue higher education, but options are wide-ranging and vary from state to state, institution to institution. At the time of this writing, according to the National Association for the Education of Young Children (NAEYC), there are approximately 1300 Associates degree programs, which typically take two years to complete, 1069 Bachelor's degree (4 years, public or private institution) programs, 612 Master's degree programs (typically 2 years, post Bachelor's degree) and 84 terminal (Doctoral) degrees throughout the United States. The NAEYC is an organization committed to ensuring high-quality early care and education, and its work focuses on connecting policy, practice, and research. (2020)

Some states require teaching licenses in addition to degrees, although even within states, licensing requirements vary from site to site, provider to provider. As such, there are few unifying standards that are present in all early childhood education preparation programs. The NAEYC has provided "Professional Standards and Competencies for Early Childhood Educators" (2019); meant to be a framework or set of guidelines for what early childhood educators should all know and be able to do regardless of which teacher preparation program they complete. These recommendations are intended to guide local policies, programs, and/or educator professional preparation programs. How (and if) they are adopted, and by which programs, licensing organizations, and states, is inconsistent across the United States. Nevertheless, NAEYC is considered by many in the early childhood education profession as the "Gold standard" and is very highly regarded by those in the profession, whether or not the state in which their program exists has used the NAEYC standards in its framing, assessment, and licensing of early childhood programs.

As one might expect, this variation in the accessibility, availability, content, and requirements of professional education programs means that there is no national curriculum for young children, as there is in some other countries. Commonly, US teacher preparation programs include practica-hours spent in classroom settings observing the behavior and interactions of young children. These opportunities are seen as critical to the development of teachers of young children. As coursework from program to program varies so much, it's challenging to determine which programs include opportunities for students to complete practicum hours outdoors or in sustainability-focused or nature-based settings, however many institutions do require practicum hours spent inside classrooms, observing and assessing children's behavior and gaining valuable experience.

The structure of the paper is as follows: the survey design will be presented in the next two sections, followed by a discussion of the findings from the survey and next steps. A discussion of the survey limitations and thoughts about next steps will conclude the paper.

### **Survey design**

The following steps were completed as part of the survey design and implementation:

1. Conduct preliminary literature review to ensure the survey would close some gaps in understanding or research
2. Design the survey to identify basic demographic information; identify the variety of contexts in which nature-based early childhood education figures in teacher preparation programs, including by whom,



where, and to what extent; and to provide space for those working in teacher preparation to voice their opinions, express any identified needs for the field, and begin to build a network of teacher education professionals engaged in this work

3. Obtain clearance from Hamline University's Institutional Review Board to conduct web-based research through the use of Google forms
4. Distribute the survey to networks of teacher preparation providers, using contacts provided by the research design team and administrators at Natural Start/NAAEE
5. Perform qualitative analysis of data, searching for emergent themes. and
6. Summarize and share results at a "Higher Education Summit" at the Natural Start Conference, in Manchester, New Hampshire, in the summer of 2019.

This paper shares the results of steps 1-5.

The aim of the survey was to better understand the ways and means by which teacher preparation programs throughout the US are addressing nature-based learning and its role in young children's development and education. A representative of the Natural Start Alliance, an organization of the North American Association for Environmental Education, approached the author of this paper and requested the development of a survey to not only determine the state of NbECE in teacher preparation programs throughout the United States, but to also identify any needs or opportunities by which it, as an organization, could support the field of teacher education more broadly. It was suggested that determining the current opportunities for teacher education and professional development would be an appropriate first step—a baseline of information from which to learn more. Importantly, the survey needed to provide a baseline from which future surveys could springboard. The preliminary review of literature indicated a wide range of teacher education programs throughout the region, few of which articulated explicit nature-based education on their website or other marketing materials. This information helped to structure the survey structure and questions.

The design of the survey was established with the understanding that it would be shared with a network of early childhood education professionals, many of whom were familiar with the concepts of ECEfs or NbECE. From the beginning, the intention was to share the survey via Google forms with known networks of educators involved, however tangentially, in teacher preparation and who had some connection to or interest in NbECE or ECEfs. The surveys were thus delivered via links provided in email sent from planning team members to individual networks, social media platforms, Natural Start website and news updates, the North American Association for Environmental Education website and other relevant web-based channels. To incentivize participation, respondents could choose to leave their name and contact information to be entered into a drawing to receive free conference registration at an upcoming Natural Start conference.

The survey team conducted a review of higher education programs either known to be or suspected to be offering NbECE training and education for teacher candidates. The design team looked at schools of education that offer Bachelor's degrees, Associates' degrees, and Masters' degrees in early childhood education, early childhood studies, as well as licensure in early childhood and primary grades education. Additionally, two-year programs, certifications in early childhood education or related programs were also reviewed. It was important for the purposes of this study to cast a wide net. Given the variety of settings and contexts in which early childhood teacher education is available, the survey language was intended to encompass any and all opportunities for teacher candidates to learn more about nature-based learning, sustainability, etc. Thus, the following caveat was included in the introduction to the survey: *For purposes of this survey, we are interested in programs or courses which fit broadly into our understanding of nature-based early childhood education and may include the following terms: "early childhood environmental education," "early childhood education for sustainability," "place-based early childhood education," "early childhood special education," "early childhood education." Again, we are interested in programs that specifically address the role of nature in early learning.*

Questions were created and several drafts of the survey were reviewed and edited by a team (led by the author) resulting in a final survey draft. The design team aimed to keep the number of questions low to encourage participation. Hence, the final survey consisted of a total of 15 questions:

- 4 Multiple Choice/checkbox questions
- 6 Open ended questions
- 2 ranking questions
- 3 Boolean questions (yes/no, name of state)

There were two optional questions where respondents could provide their contact information and/or the name of their institution.

## Results

The survey was completed in October 2017, and was available and being actively shared from then until August, 2018, for a total of ten months. Despite this, only 52 responses were recorded. Possible reasons for the low response rate will be discussed in the limitations section. The survey had 3 sections: Demographics, "Determining the Need" and "Looking Ahead." Questions and results from each section follow.

### Demographics

The survey was focused on programs and services, as opposed to individuals and therefore data collected on individuals was limited to title or position held. Specific questions and results for this section were focused on institutions. Questions sought information related to the category of institution, as well as programmatic offerings. A question was included to identify the role of the survey respondent, with no additional personal information relevant to the study.

***Which of the following best describes your institution*** was the first question and sought to capture the variety of educational settings with which respondents identify. Of the 52 respondents, 52% Public 4-year University or college, 17% Private 4 year college or university; 8% PD provider; 8% Community College. Respondents also had the option to specify an alternate setting by choosing "other" and they were given the option of specifying a context. Examples such as "Forest school," "botanic garden," "preschool," and "non-profit education center" were listed, but not all respondents chose to specify what they meant by "other."

***In which state is your institution located*** was the next question. 22 United States were represented and there were 5 respondents not from the United States.

Respondents identified themselves as:

- 52% full time faculty
- 14% adjunct faculty
- 10% non-teaching care provider/director of program
- 4% part time faculty
- "Other"- student, program manager, interpretive naturalist, etc.

Next, respondents were asked ***which of the following, with an explicit focus on NbECE, does your institution offer.*** Bearing in mind the note in the introduction of the survey, we hoped and expected that responses would be inclusive of all of the terms we provided to cast as wide a net as possible and determine the scope of available offerings. Respondents could select as many as apply from a list of options and responses were grouped into the following categories as shown in Table 1. The data in these tables are not broken down into percentages, as some institutions offer more than one context in which NbECE is delivered. Rather, the units shown here are reflective of individual checkmarks submitted in the survey.

Table 1

Responses to the question: **Which of the following WITH AN EXPLICIT FOCUS on NbECE does your institution offer? Select all that apply.**

<b>Educational offering</b>	<b>Individual selection from checklist</b>
<b>Licensure</b>	
Early childhood education	19
Early childhood special education	11
<b>Undergraduate degree (2- or 4- year)</b>	
Environmental studies	8
Early childhood studies	17
Early childhood education	8
Sustainability or sustainability education	6
<b>Graduate degree</b>	
Sustainability or sustainability education	6
Environmental studies	8
Environmental education	3
Early childhood studies	9
Early childhood education	5
<b>Nothing like this is offered at my institution</b>	3
<b>Just courses</b> , no licensure or degree attached to those courses	43
<b>Professional Development</b> (no academic credit) workshops or courses	19
<b>CERTIFICATES</b>	4 2 under development

### **Determining the need**

Questions in this section of the survey were designed to elicit participants' thinking and perceptions of the value and need for coursework or other educational opportunities that are specifically focused on NbECE.

***In your personal opinion, is there a need for NbeCE coursework and training in higher education/teacher preparation programs*** was the first question asked in this section, with 99% of respondents selecting “yes” and 1% selecting “unsure.”

***Why or why not*** was the next, open-ended question. Several responses to this question focused on the benefits to children; their well-being and academic development. A much greater number of respondents described the benefits to their adult students entering the teaching profession, or the challenges they face though these responses tended to be focused more on professional outcomes (i.e., job prospects) than overall well-being such as was suggested for children.

To organize these responses, a process of open coding (Saldaña, 2009) was employed by the author to identify themes and subthemes that emerged within the broader context of benefits to children or benefits to educators. The following themes emerged when analyzing the type and content of responses to this question: Benefits to children, challenges within teacher preparation, and needs of the field. Tables 2, 3 and 4 identify the subthemes along with representative quotes from responses to provide examples of respondents’ thinking along these lines.

Table 2  
Responses Related to *Theme 1: Benefits to Children*

<b><i>Theme 1: Benefits to children</i></b>	
Subthemes	Representative quotes provided by respondents
<b>Academic learning</b> and/or likelihood to choose a science, technology, engineering, or mathematics-related career	<i>“We need to ensure early connections to learning in nature that will strengthen K8 learning and green career pathways- establish a pipeline from beginning”</i>
<b>Well-being:</b> social-emotional learning, stress relief	<i>“Physical and mental health, social and emotional development, and self-regulation are all areas impacted [as well as increased knowledge of natural science and ecological awareness].”</i>
<b>Stewardship</b>	<i>“Taking care of our planet is critical for us.”</i>
<b>Sense of place</b> and nature connection	<i>“Children and adults need to forge strong sense of place and nature’s relationship to our very existence.”</i>

Table 3  
Responses related to *Theme 2: Challenges within teacher preparation*

<b><i>Theme 2: Challenges within teacher preparation</i></b>	
Subthemes	Representative quotes provided by respondents
<b>Limited options exist</b> for preservice teacher education or practice	<i>“Coursework is currently limited for NbeCE training, unless you attend conferences annually. “</i>
<b>Not enough faculty prepared to teach</b> about NbeCE	<i>“There is a push to take education outside and into/with nature, but there is very little being taught about how to go about doing that. Nature can’t just be seen as a</i>

	<i>backdrop for education; it has to be seen as one of the many educators.”</i>
NbECE is still <b>too far outside the norms</b> of traditional teacher education	<i>“Despite what appears to be growing interest in this field, most teachers and administrators continue to view NbECE as far beyond their professional comfort zones. The field cannot advance if educators don't know how to proceed.”</i>
<b>The professional benefit to students is not yet clear</b>	<i>“Not only to address the growing interest by families in NbECE, but to provide this workforce with the knowledge base of ECE.”</i>

Table 4

Responses related to *Theme 3: Needs of the [early childhood education] profession more broadly*

<b><i>Theme 3: Needs of the [early childhood education] profession more broadly</i></b>	
Subthemes	Representative quotes provided by respondents
Teachers who know how and why to use this <b>pedagogical approach</b>	<i>“The setting in which NbECE occurs is quite different from the traditional classroom. Thus, in order to be adequately prepared to teach in this setting, a different approach to teacher preparation is needed.”</i>
Teachers need to have <b>content knowledge</b> related to environmental literacy/stewardship/sustainability	<i>“Educators need to be able to foster nature inquiries and teach children about environment and the bigger topic of sustainability”</i>
<b>Compliance with laws and policies</b>	<i>“As NbECE expands into existing licensed care facilities, teachers need these credentials and training opportunities to comply with local, state, and federal regulations. If training and coursework is more readily available to traditional early childhood educators, then they are more likely to adopt NbECE practices into their classrooms.”</i>

The question, *if you answered ‘yes’ above, what needs exist within institutions of higher education to better support teacher preparation in NbECE*, was optional. As with the question above, a process of open coding helped the author to identify themes. Four themes emerged: Faculty resources; additional coursework or opportunities for students to learn; institutional support; and practical opportunities for students. Table 4 provides a breakdown of responses for each theme, along with representative quotes for each theme to provide an example of context.

Table 4

Emergent themes in response to the question *what needs exist within institutions of higher education to better support teacher preparation in NbeCE*

Emergent themes	Individual responses grouped within this theme	Representative quotes provided by respondents
<b>Faculty resources</b> (understanding the need, competent/experienced faculty)	18	<i>“Trying to convince [early childhood education faculty] of the value of this, that this is legitimate, that there is space and need for this.”</i>
<b>Additional coursework/opportunities needed</b>	11	<i>“More coursework, observation, placement, and certification programs, as well as a deeper understanding as to why this is both relevant and beneficial.”</i>
<b>Institutional supports</b> (funding/financial accessibility for students, awareness of the value of NbeCE)	13	<i>“Understanding how NbeCE can support critical awareness, equity issues in Education (and other reasons why it’s important). Also methods and experiences (how). To integrate across content areas (not limited to science).”</i>
<b>Practical opportunities for students</b> (clinical settings, study away trips)	11	<i>“Better links between academia and practice”</i>

The fourth question, ***thinking about any early childhood education classes or degree programs WITH AN EXPLICIT FOCUS ON NbeCE, how would you describe enrollment over the course of the past 3 years*** was a multiple-choice question with the option to supply a custom response by checking “other.” Notably, 40 % of respondents selected N/A-meaning not applicable, suggesting that those respondents either do not have access to enrollment data, or possibly that they perceive that their classes or degree programs do not have an explicit focus on NbeCE (see Fig 1).

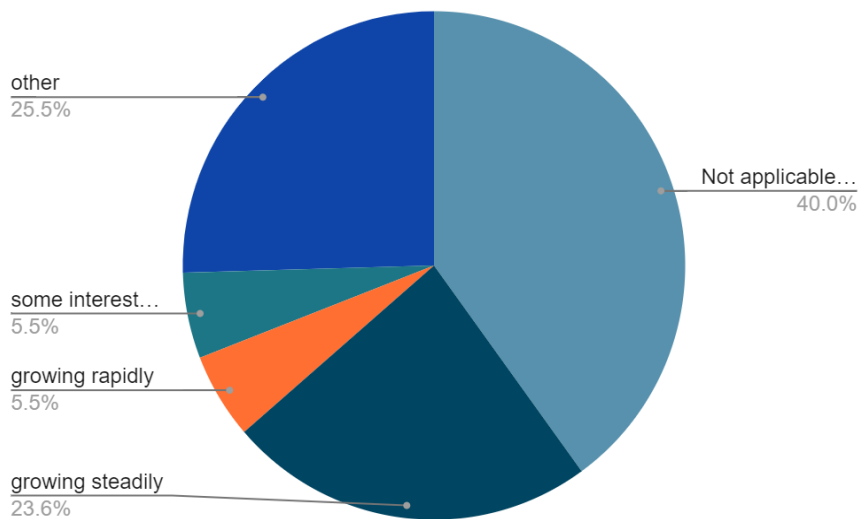


Figure 1. Responses to “Thinking about any early childhood education classes or degree programs WITH AN EXPLICIT FOCUS ON NbeCE, how would you describe enrollment over the course of the past 3 years?”

The final question in this section was a ranked scale: *if your program/institution offers specific NbECE coursework, how would you rate the INTEREST in these courses over the past 3 years?* Approximately, 85% of respondents indicated some to extreme student interest in the courses.

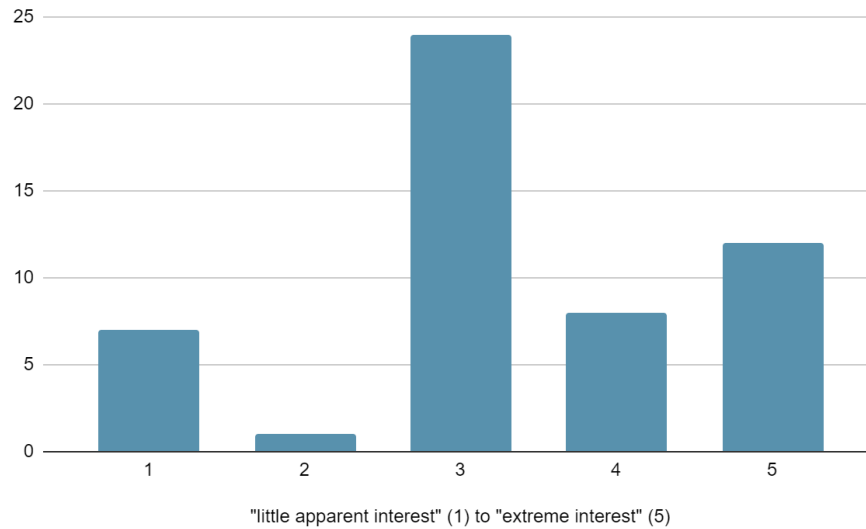


Figure 2. Responses to “How would you rate student interest in NbECE courses?”

**Looking ahead**

The aim of this section of the survey was partially to gather information about participants’ views toward creation of a national accreditation or credential for NbECE.

*What can institutions of higher education do to better support the NbECE community* was the first question and was also optional. Individuals could include one to many items in their responses, so many respondents listed several suggestions, while some provided only one. Overall, the prevailing themes were related to offering more coursework or professional development opportunities, and increasing visibility or promoting the profession. Suggestions that were offered more than once but fewer than 5 times were grouped into the following themes: create partnerships with organizations or programs doing NbECE; reduce tuition costs, influence policy to increase NbECE in local communities; help students find jobs in the field.

Table 5

Emergent themes related to the optional question *What can institutions of higher education do to better support the NbECE community?*

Emergent themes	Individual responses grouped within this theme	Representative quotes
Offer more coursework or Professional development opportunities	22	develop & share course [curricula], find ways to offer NbECE field experiences,
Increase visibility for the profession and NbECE	9	create bridges with local early ECE settings so graduates are connected with job opportunities

The next question was required, and it was a yes/no/maybe question. *If there were a national certification or credential for NbECE, would that be a valuable contribution to the field?* To which 59.6% of respondents selected yes, 3.8 % selected no, and the remaining 36.5% said maybe.

If there were a national credential for NbECE, would that be a valuable contribution to the field?

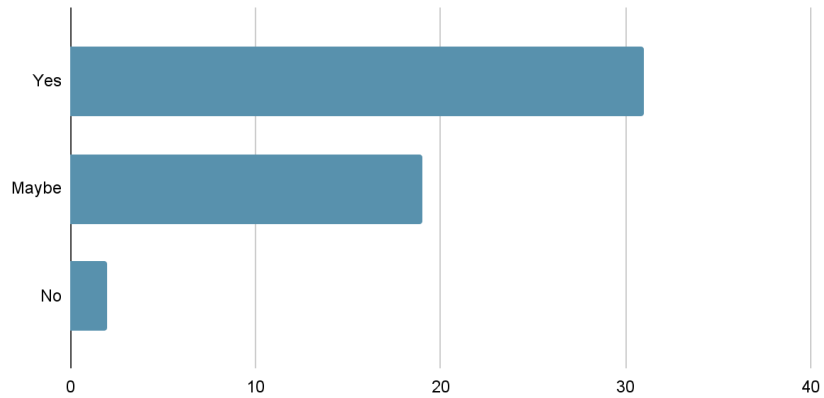


Figure 3. Visual representation of question “*If there were a national credential for NbECE, would that be a valuable contribution to the field?*”

Many of the respondents to question #2 chose to elaborate on their responses in the next question, which was an open-ended, optional question: *why or why not?* Respondents who selected any of the options (yes, no, maybe) to question 2 were invited to share their thoughts. The themes that emerged upon review of the responses were grouped into two major categories: *why* and *why not*. In the *why* category, the subthemes that emerged were: benefits to children, visibility and legitimacy for the discipline, the growth in the number of NbECE-focused settings suggests a need; and the benefit to preservice and inservice teachers.

If there were a national certification or credential for NbECE, do you think the demand among students would be....

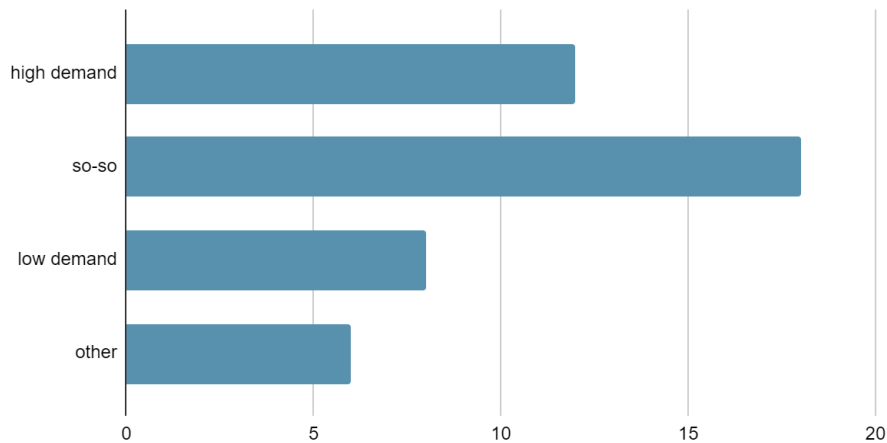


Figure 4. Visual representation of the question: *If there were a national certification or credential for NbECE, do you think the response from students would be....*



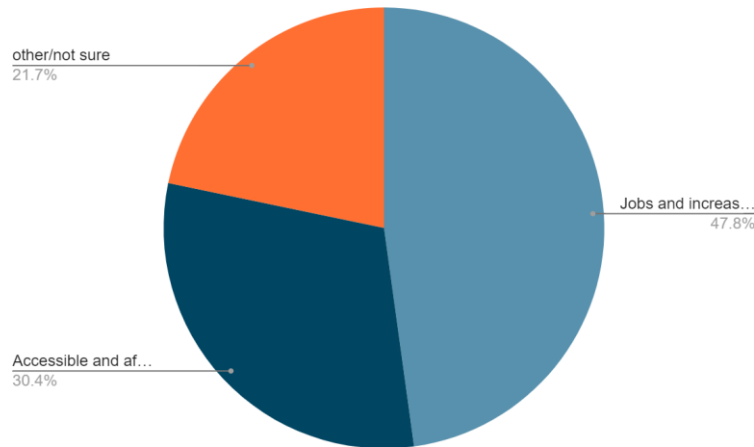


Figure 5. Responses to "What would make a national credential appealing to students?"

### Discussion

The survey provides a clear, albeit limited, picture of the many barriers to any unified understanding of how best, and indeed whether to deliver NbECE within teacher education programs. While respondents were generally interested in the topic, and willing to share feedback as the responses indicate, there are divergent rules, regulations, certifications and policies present in every state and often within states. As expected, the survey, despite its limitations, provided important insight into multiple issues and opportunities concerning NbECE in the United States. It highlighted a growing interest in the field of NbECE and a desire among many in teacher education to support preservice and inservice teachers' skills and confidence in this area. It further elucidated a clear need for structural supports within institutions of higher education including faculty who are skilled and competent in this area, a need for greater visibility of the benefits of NbECE, and also an awareness of the many barriers to participation and access to coursework and training in NbECE among institutions of higher education for interested preservice or inservice educators. There was also a clear need expressed by respondents to collaborate or work with state agencies that are involved in licensing of educators and also program sites, as well as to be more actively involved in helping students find practical experience and jobs.

Awareness of these issues will help those who teach and conduct research in early childhood teacher education, environmental education, or education for sustainability, better understand the experience and perspective of many of their colleagues. The perspectives gleaned from this survey will hopefully help to guide future questions for research and development of teacher education programs or credentials that focus on NbECE.

### Limitations

There are numerous limitations of this survey; including small sample size, survey design, and ambiguity in some of the questions. In spite of this, however, it has offered a valuable baseline of knowledge related to the presence and potential for NbECE within institutions of higher education. As a reminder, the original purpose of the survey was to determine *what opportunities exist for professional development and preservice teacher education around nature-based early childhood education?* The survey team intended to use this information to establish baseline information on the state of nature-based early childhood education (NbECE) teacher preparation in higher education as well as to identify potential areas for advocacy and growth.

**Small sample size.** Despite being open and accessible for 10 months, the survey only received a total of 54 respondents. This is most likely due to the means by which the survey was shared: the link for the survey was disseminated from within the popular Natural Start organization to individuals already working within higher education, and who had expressed or demonstrated interest in NbECE within higher education. Individuals within those networks were asked to share the link with their networks, many of whom are already involved in or interested

in NbECE within higher education. As a result, the survey respondents already likely had some “buy-in” to the topic, resulting in a limited picture of the topic. It would be helpful to have responses representing higher education more broadly. In the future, the survey will be shared with a wider audience, including higher education institutions that aren’t necessarily already involved with NbECE to any significant extent. There are also several national organizations (including the National Association for the Education of Young Children) that could be tapped for support in disseminating the survey more broadly throughout the field of early childhood researchers and practitioners who likely have important insights to these issues.

**Survey design.** The number of open-ended questions provided in the survey allowed for thoughtful and reflective responses, which offered a glimpse into many different perspectives and ideas about NbECE in teacher preparation. The nature of these sorts of comments demands individual analysis and is subject to the author’s interpretation, bias, and presuppositions. Moreover, the coding process used in analyzing the survey results is just one possible approach to interpreting the data (Belotto, 2018; Mazeley, 2009). A future version of the survey could include fewer open ended questions to eliminate or reduce bias, increase validity and credibility. More closed-ended questions would also provide for more concrete analysis of results.

**Ambiguity.** The original purpose of the survey was to establish baseline information on the state of nature-based early childhood education (NbECE) teacher preparation in higher education as well as to identify potential areas for advocacy and growth. However, as described in the introduction to this paper, “nature-based” early childhood education is defined very broadly across the field of early childhood education, and can—and often does—include many possible ways to support and respond to children’s relationships with the environment. As was shared with all respondents, in the beginning of the survey, “for purposes of this survey, we are interested in programs or courses which fit broadly into our understanding of nature-based early childhood education and may include the following terms: *early childhood environmental education, early childhood education for sustainability, place-based early childhood education, early childhood special education, early childhood education.* Again, we are interested in programs that specifically address the role of nature in early learning.” While the survey team tried to be explicit about the multiplicity of program types, it is possible that respondents interpreted these terms differently.

The limitations identified herein will help to guide further development and refinement of the survey in order to more effectively collect data in future iterations.

### Conclusion

While this survey and analysis process is not without its limitations, it has provided important fodder for continued investigation of the original question *what opportunities exist for professional development and preservice teacher education around nature-based early childhood education.* It offered a glimpse into the perceptions of others working in higher education settings, or who have interest in how teacher preparation programs are engaging with NbECE. Analysis of the survey results further suggested ways to refine the questions, reach a broader audience, and ultimately provide more information about the presence of NbECE in teacher education, needs of the profession, as well as barriers and challenges that exist. Ultimately, the field of early childhood teacher education will benefit from a better understanding of the nuances outlined in this paper, suggesting value in refining and repeating the survey.

Perhaps not surprisingly, the results of the survey underscore the fact that with teacher preparation programs in the United States, there is great variation depending on a wide range of factors; location, workforce availability, perceived value of NbECE skills and experience, employment prospects, and local, state, regional and national guidelines and regulations. Despite these differences, at least among the survey respondents, there is generally support for this discussion and a recognition that it is an important topic for the profession and for teacher education programs throughout the United States.

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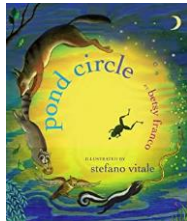
## CHILDREN'S BOOKS AND RESOURCES REVIEW

Carla Gull  
*University of Phoenix, USA*  
Book and Resource Review Editor

### Life in a Pond

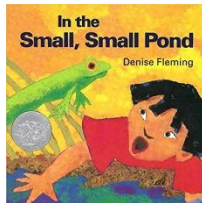
Ponds are a great place to explore with young ones. So much life happens in a pond—microorganisms, macroinvertebrates, algae, plants, amphibians, reptiles, mammals, and birds. Explore ponds with these great read aloud books and additional resources.

***Pond Circle*** by Betsy Franco



In this circular story, move from the pond to algae, nymph to diving beetle, frog to snake, skunk to owl, raccoon to owl's eggs, a coyote stalking the raccoon, and finally a girl in the nearby house hearing the coyote. The story shows a food chain around a pond with additional non-fiction information about the animals and algae in and around the pond at the end.

***In the Small, Small Pond*** by Denise Fleming



A simple story of a child exploring a pond uses rhyming and sound words like splash, kerplow, waddle, jiggle, and wiggle to bring a pond to life. See the pond through the frog's eyes and the animals it encounters. The bright colors of the pulp painting bring the reader into the world of the pond in this Caldecott Honor Book.

***Over and Under the Pond*** by Kate Messner



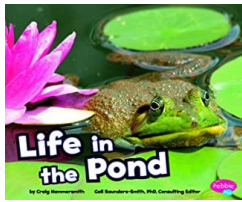
A mother and son in a boat on the pond wonder what is under the pond. The text alternates between what is found over the pond (rushes, whirligig beetles, painted turtle, moose, etc.) and what can be found under the water (minnows, brook trout, caddisfly, beaver, etc.). This book is full insects, amphibians, fish, mammals, reptiles, and birds that can be found in and around a pond. I loved the perspectives of illustrations from the bottom of the pond looking up at the bottom of the swimming animals and boat through the water as well as from the tops of the trees looking down. Nonfiction information at the end of the book looks at the importance of a pond as an ecosystem, as well as information about the highlighted animals in the story.

***Near One Cattail: Turtles, Logs and Leaping Frogs*** by Anthony D. Fredericks



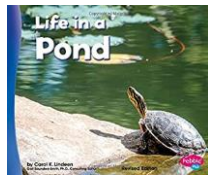
Frog introduces this circular tale with a letter to friends sharing more information on the animals. The rhyming book has lovely illustrations with varying perspectives from up above, eye level peeking through and under the water. The Field Notes at the end give additional information on each of the animals and cattails found in the pond and book.

***Life in a Pond*** by Craig Hammersmith



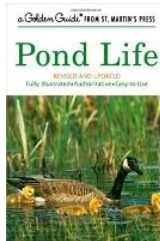
This nonfiction book with table of contents, glossary, and index takes a simple look at major types of animals in a pond—insects, frogs, mudpuppies, birds, turtles, fish, and beavers. There are great photos of the animals in each spread with 3-4 sentences of informational text alongside. Fun facts are included in the back. This is an okay introduction to pond animals but seems like it could consistently be more or less specific, either using generic groups for all the groups of animals or a species from each group. However, the more general approach allows adaptation for specific animals in your area.

***Life in a Pond*** by Carol K. Lindeen



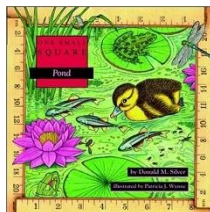
This is another nonfiction book with table of contents, glossary, and index. While animals are one section of this book, it focuses more on what a pond is, plants that grow there, and how all the plants and animals are needed for the pond to work as a habitat. The book has 2-4 sentences per 2 page spread with large photos taking up 2/3 of each spread.

***Pond Life*** by George K. Reid



This Golden Guide field guide is the perfect size for little hands. The guide starts with general information on ponds and lakes, water, habitats, food webs, plants, animals, and more information. It has a little of everything with algae, aquatic plants, shore plants, trees, insects, shells, fish, birds, reptiles, mammals, and amphibians. While the reading level is higher, the drawings help see an overview of pond life.

***Pond (One Small Square Series)*** by Donald Silver



Geared for ages 6 and above, look at how much life is in a small square of pond even down to a drop of pond water. This informative text offers ways to explore a pond as well as gives detailed illustrations of the animals and organisms that can be found in a pond. The book includes a field guide, index, glossary, and resource list.

**Additional Resources:**

How to Go Pond Dipping—Use simple tools to explore macroinvertebrates in a pond.

<http://www.metrofieldguide.com/how-to-go-pond-dipping/>

What Floats Your Boat—Be inspired by Curious George and experiment using newspaper to make and float a boat on a pond.

<https://tinkergarten.com/activities/what-floats-your-boat>

Pond Video Playlist—YouTube playlist centered around organisms found in a pond

[https://www.youtube.com/playlist?list=PLRaq2fWj05NPToikL\\_eCRssDzfSAyM\\_V](https://www.youtube.com/playlist?list=PLRaq2fWj05NPToikL_eCRssDzfSAyM_V)

Observing Pond Water--Pond versus sink water explorations and observations

<https://www.pre-kpages.com/science-kids-observing-pond-water/>

If you have ideas or would like to contribute book or resource reviews, please contact Dr. Gull at [Carla.Gull@phoenix.edu](mailto:Carla.Gull@phoenix.edu).

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