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Perspectives from Caregivers on the Advantages of Nature-Based Education Before and During COVID-19 Pandemic

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ABSTRACT

Nature-based preschool programs continue to grow in popularity across the world. These programs provide children with critically important experiences and help them gain skills that contribute to early school success and accomplishments later in life. However, the COVID-19 pandemic and mandatory lockdowns resulted in reduced opportunities for children to attend in-person preschool programs of all types. Under these circumstances, researchers hypothesized that COVID-19 would have negative or even deleterious effects on students' well-being, but that these effects might be buffered by spending time outdoors and engaging with nature. The purpose of this study was to gain perspectives from caregivers in the United States (US) about the effects of a nature-based program on their children and determine how the COVID-19 pandemic and subsequent loss of access to the preschool affected their children. Using a mixture of choice and open-ended questions, 91 caregivers shared perspectives on their children's outdoor activities, sleep habits, and general mood/well-being. Open-ended responses were qualitatively coded into major thematic categories. Results indicated that although the lockdowns had some negative effects in terms of sleep quality and general well-being, most children were resilient as they remained active outdoors and maintained healthy sleep patterns. Furthermore, many caregivers specifically attributed the development of this resilience to the nature-based preschool and the habits it instilled in their children. This research highlights the potential positive influences that nature-based preschool has on children and how these programs can contribute to resilient children who are better equipped to deal with disruptions to daily life.

Keywords**:** preschool, resilience, sleep quality, time outdoors, well-being

The impacts of the COVID-19 pandemic on young children have been various, significant, and widespread. In some cases, children's eating habits, activity levels, and sleep quality were negatively affected (Clarke et al., 2021). Other studies point to decreased mental health, increased depression, and escalated externalizing behaviors such as temper tantrums and fighting with household members (Glynn et al., 2021). In fact, during the COVID-19 pandemic, 52% of caregivers reported that their 3-5 year-old children experienced excessive crying or irritability, 60% were easily bored, and 14% experienced excessive sadness or worry, pointing to the deleterious impact of the pandemic

on preschoolers' mood (Arazi et al., 2022). In addition to these effects on children, there have also been negative ramifications for families including the added burden of remote teaching/learning (Timmons et al., 2021). All of these negative impacts due to the temporary absence of in-person preschool programs during the pandemic have reinforced the importance of quality early childhood education. For example, children enrolled in preschool programs gain crucially important social and emotional skills (Howes et al., 2008), and these skills, along with subsequent behaviors, contribute to early school success (i.e., academic achievement and health and well-being outcomes) as well as accomplishments in later phases of life into adulthood (Goldfeld et al., 2016; Raver, 2002; Thompson & Lagattuta, 2006).

As researchers continue to uncover negative impacts of the pandemic on young children, they are also discovering ways in which children have shown resilience. Historically described in many different ways, resilience can be defined as the human capacity to cope with stress (Masten, 2001). Mechanisms that have been shown to promote resilience in children during the pandemic thus far include well-established family routines (Cusinato et al., 2020), high-quality familial relationships (Masten & Motti-Stefanidi, 2020), adequate sleep (Tso et al., 2022), and engagement with at-home learning (Lokhandwala et al., 2021), to name a few. Interestingly, younger children appear to be more resilient than older children and adolescents, especially with respect to sleep disturbances (Sharma et al., 2021). One particularly understudied area in terms of building resilience is nature-based preschooling. Nature-based preschools are gaining international popularity (Leather, 2018), and research points to the positive effects that being outdoors can have on well-being (including but not limited to physiological, psychological, and socioemotional health) (Carpenter & Harper, 2015; Pasanen et al., 2014). In the current study, researchers hypothesized that COVID-19 would have negative or even deleterious effects on the sample children's well-being, but wondered if these effects might be mitigated by children spending time outdoors and engaging with nature. The purpose of this study was to gain perspectives from caregivers in the United States (US) before and during the COVID-19 lockdowns and determine the effects, if any, that engaging with nature through preschool had on children's well-being, including physical activity, outdoor engagement, sleep patterns, and mood.

Benefits of Being Outdoors

The publication of Richard Louv's *Last Child in the Woods* in 2005 brought renewed attention to the importance of spending time outdoors and spawned the term "nature-deficit disorder." According to Louv (2005), the term is not a diagnosis, but a way of viewing the cost associated with humans alienating themselves from nature. Clear trends show that life for many in industrialized countries has moved indoors. For example, research indicates that people in wealthy nations spend less than 10% of a typical day outdoors (Capaldi et al., 2015), and 90% of life is spent inside of buildings (Evans & McCoy, 1998). Research continues to link positive well-being with being outdoors, and even legislative bodies have taken actions to provide additional access to outdoor spaces. For example, in the US, the *Every Kid Outdoors Act* in 2019 provided free access to federal lands and waters to fourth graders and their supervising adults.

Furthermore, research involving outdoor interventions has revealed many positive aspects in regard to physiology, psychology, and socioemotional health. In some cases, contact with the outdoors lowered blood pressure (Lee et al., 2009) and increased physical fitness (Louv, 2015). Brief contact with nature has also been linked to improved emotional well-being (McMahan & Estes, 2015), with activities as simple as walking in rural environments improving mental outlook (Selhub & Logan, 2012). In addition, interventions such as wilderness therapy have been shown to increase self-efficacy (Margalit & Ben-Ari, 2014). Outdoor learning experiences have been linked to increased academic performance and helping students make more connections within their communities (Leather & Nicholls, 2016).

Outdoor Schooling

In addition to the emphasis on getting outdoors in informal contexts, many schools are being more intentional about getting their students into the outdoors. Led by countries like Denmark, Finland, and Sweden, forest and nature schools have existed in Europe for many years (Westwood, 2013). Non-European countries like New Zealand, Australia, and Singapore are also well-represented in the literature. The movement is quickly catching on in the US,

as the number of nature-based preschools in the US doubled to 586 from 2017-2020 (North American Association for Environmental Education (NAAEE), 2020). This massive movement is fueled in part by a growing sense that outdoor recess is not simply a mechanism for allowing students to expend energy before "real" school starts. To the contrary, many are beginning to view contact with nature as fundamental to a proper education (Turtle et al., 2015).

Positive Outcomes

A recent literature review of school-based outdoor interventions summarized that students needed fewer redirects after being outdoors (Kuo et al., 2018). At the middle school level, outdoor-based learning was connected to greater motivation in students who had previously come to view school as "meaningless" (James & Williams, 2017). In younger children, Elliot et al. (2014) discovered that Kindergarteners had deeper engagement in outdoor-based pedagogy than did traditional students. Forest school settings also improved mood in both students who had previous behavioral challenges in schools and those who did not (Roe & Aspinall, 2011).

In some cases, these types of positive outcomes have been associated with specific factors that exist in outdoor settings. For example, nature-based schools afford students opportunities to engage in more physical activity, and students in nature-based schools are exposed to more natural daytime light than students in traditional classroom settings. These facts are important because increased physical activity and more exposure to natural light have been shown to positively affect sleep quality and quantity (Boubekri et al., 2014; Lang et al., 2013). Moreover, increased physical activity has been shown to buffer the impacts of stress on academic performance in adolescents, leading to better sleep (Wunsch et al., 2017).

Resilience

Ernst et al. (2019) suggested that resilience in children is built through improved self-control and self-regulation. These authors point out how play in nature often involves children interacting in social groups away from adult supervision, a situation that improves self-regulation over time. Furthermore, Chawla et al. (2014) suggested that children can experience reduced stress when exposed to nature, a condition that also contributes to resilience. Wells (2021) went so far as to say that, "…within the context of resilience, nature may buffer (dampen) the impact of risk and adversity on human health, development, and functioning" (p. 195). This author goes on to share multiple studies showing evidence of a connection between nature and resilience in humans.

Research Questions

As information about the effects of COVID-19 on the education system in the US continues to emerge, researchers in the current study wondered how the shutdowns and isolation of children from nature-based schools potentially affected their well-being. In spite of positive associations between preschools, nature contact, and children's well-being, the COVID-19 pandemic has brought never-before-seen challenges. As a result, this study pursued answers to the following research questions:

RQ1: Pre-COVID, what were caregivers' perceptions of the effects of a nature-based program on their children?

RQ2: How did the COVID-19 pandemic and subsequent loss of access to the nature-based preschool affect children and families? Was there any evidence of resilience in children?

In order to answer these questions, we focused on changes in physical activity, sleep, and mood in order to use a whole-child approach to understanding physical and socioemotional health. Physical activity and sleep are tangible measures of physical health, while the regulation of emotions, behaviors, and mood are tangible measures of socioemotional health. The purpose of this study was to gain perspectives from caregivers in the US about their children's well-being before and during the COVID-19 pandemic. Furthermore, researchers wondered whether any evidence suggested that the deleterious effects of the COVID-19 pandemic were dampened by children's association with the nature-based preschool program; if so, it would suggest a form of resilience.

Context of Current Study

The preschool in the current study was owned and operated by a nonprofit outdoor education company in the Midwest. The philosophy and mission of the preschool centered around engaging students' natural curiosity in order to prepare children for future lives of active learning and connection to nature. The daily schedule of each classroom consisted of arrival, outdoor choice time (1 hour), outdoor clean-up and recall to reflect on and talk about their outdoor play experiences (15 min), outdoor whole group meeting (15 min), outdoor hike (15 min), transition to inside (5 min outside, 5 min inside), inside snack (10 min), indoor choice time (20 min), indoor clean-up and small group meeting (20 min), final whole group meeting (5 min), and pick-up (10 min). Children spent 60% of their time outdoors and 40% of their time indoors during a typical 180 minute class day. The program used developmentally appropriate practices grounded in child-centered, experiential play-based learning to implement an evidence-based curriculum called, *Creative Curriculum* (Dodge et al., 2010).

This daily schedule shifted in March 2020 during the pandemic when schools were required to be closed. During the COVID-19 pandemic, caregivers were provided with resources intended to get children outside and connect with nature from home at their own pace when it worked best for their family. These resources included a Facebook page for interested families where families could post pictures of activities they had tried and to provide updates. Preschool staff also provided 15-20 minute Facebook live lessons three times per week (Mon, Wed, Fri), which typically included a song or follow-along activity and book. These videos were recorded for families to view later after it went live. In addition, preschool staff created a website with weekly resources for families called "Soaring from Home." This website was created specifically for families during the pandemic. The link was shared with all caregivers of children enrolled at the nature-based preschool. The goal was to provide families with easy, developmentally appropriate ideas to work on academic/social emotional goals as well as ideas to get outside and connect with nature from home. Social workers also provided resources for caregivers to help them navigate the challenges of parenting during a pandemic.

Method

The design of this study was precipitated by the COVID-19 pandemic and subsequent closure of preschools across the US in 2020. The researchers had an established relationship with the preschool as a result of other studies that were being conducted when the pandemic manifested itself in the US. As a result, researchers amended IRB protocols and were able to gain approval in a timely fashion such that data collection could occur within the narrow window between the mandatory shutdowns in March of 2020 and the end of the traditional school year in May.

Sample

The preschool enrolled approximately 175 students. The children in the sample were from ages 4-5, and the vast majority were enrolled for the duration of the 2019-2020 school year. Students attended half day (i.e., three hours per day) preschool programming for three or four days each week. Sixty percent (60%) of their class time was spent outdoors. Caregivers (i.e., family members or other designated persons responsible for care at home) were solicited to participate and provide perspectives about their child through electronic questions. Recruiting through emails was done with the help of preschool staff. Caregiver consent reached $n = 91$, with varying levels of participation for each question in the study. Demographic information was not collected in regard to these caregivers and/or their children. Nature-based preschool students in the region are predominantly White, reflecting the demographics of the area (78.8% White, 22.3% Hispanic or Latino, 6.6% Multiracial, 5.9% Black or African American, 2.0% Asian, .5% American Indian or Alaskan Native) (U.S. Census Bureau, 2020). The race and ethnicity representation for the school district included 87.12% White, 7.08% Hispanic or Latino, 3.93% Multiracial, .96% Asian, .71% African American, and .21% American Indian or Alaskan Native students (Center for Educational Performance and Information School Overview, 2021). At the time when caregivers provided feedback for this study, the average child was 5.17 years old and on trajectory to be enrolled in Kindergarten in the upcoming fall.

Data Collection and Analysis

An electronic survey containing a mixture of choice responses and open-ended questions was emailed to caregivers by school staff in May of 2020 (see Appendix for questions).

Physical activity and outdoor engagement

Researchers used two choice questions (Appendix) to gather caregivers' perspectives on students' outdoor activity levels. In addition, an open-ended question was asked to allow caregivers to expound upon their child's activities. Responses to the open-ended question were read independently by two researchers to develop a list of codes. Researchers met and discussed the codes until a final set of codes was agreed upon. Researchers independently coded each caregiver's comments and met to discuss agreements and disagreements. Similar codes were grouped together and major themes were established.

Sleep

The aforementioned electronic survey was sent to caregivers to gather their perspectives on sleep patterns of their children. Open-ended questions were provided for caregivers to respond to in regard to their child's sleep patterns before and after COVID-19 shutdowns. These responses were read independently by two researchers who independently developed a list of codes, then met to discuss agreements and disagreements. Similar codes were grouped together, and major themes were established.

Well-being and mood

Open-ended questions were provided on the electronic survey (Appendix) for caregivers to respond to in regard to their child's well-being and mood before and during COVID-19. Caregiver responses were coded independently by two researchers who coded each caregiver's comment, met to discuss agreements and disagreements, and ultimately established final codes that were grouped together into major themes.

Resources

The electronic survey emailed to caregivers included one choice question and one open-ended question asking about the use of the resources provided by the preschool. As in the other contexts, open-ended responses were read independently by two researchers to develop a list of codes. Researchers met and discussed the codes until a final set of codes was agreed upon. Researchers independently coded each caregiver's comment and met to discuss agreements and disagreements. Similar codes were grouped together, and major themes were established.

Findings

Physical Activity and Outdoor Engagement (post-COVID)

According to most caregivers, the activity levels of their children either increased (42%; 36 of 85) or stayed the same (42%) when students were forced to stay home after COVID-19 (Figure 1). In contrast, only 15% of caregivers (13 of 85) reported decreased amounts of overall activity.

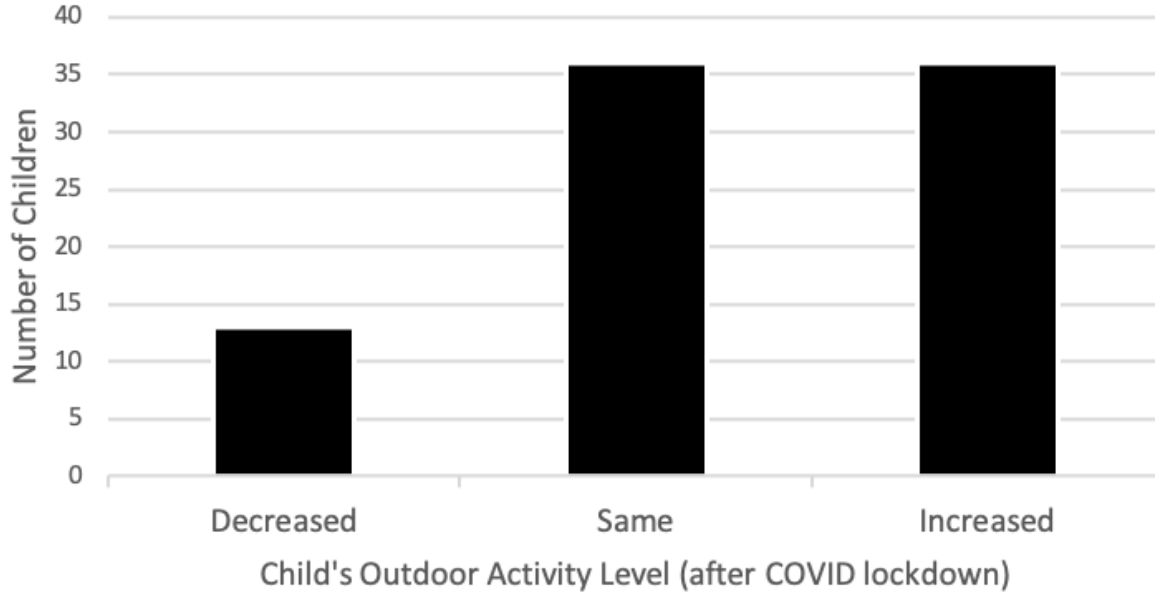
Figure 2 shows results from the question asking caregivers about how much time their children recently spent outdoors. Eighty-seven percent (87%; 77 of 89) of the responses indicated that children spent more than one hour outdoors each day. Furthermore, 9% responded that their child spent about one hour outdoors each day. Only 4% responded that their child spent approximately 30 minutes outdoors. No one responded that their child spent less than 30 minutes outdoors each day on average.

When asked to provide additional details about their children's outdoor activities during lockdown, 40 caregivers responded. Specifically, 35 of 40 (87%) provided positive comments related to outdoor activity, and 13% provided

negative feedback. Figure 3 contains a breakdown of the positive responses. Most caregivers shared how their children were spending more time outdoors because of increased family engagement in outdoor activities (31%). Other caregivers attributed their child's time outdoors to either an intrinsic love for the outdoors (23%) or the fact that the preschool program had specifically influenced their child to be outdoors more often

Figure 1

Change in Children's Activity Levels After COVID Lockdowns



Note. Prompt question: "How has your child's level of outdoor activity changed as a result of COVID-19?" (*n* = 85)

(23%), an influence that persisted into the pandemic. A smaller number of caregivers (5%) shared how their children were spending more time outdoors due to improving weather conditions.

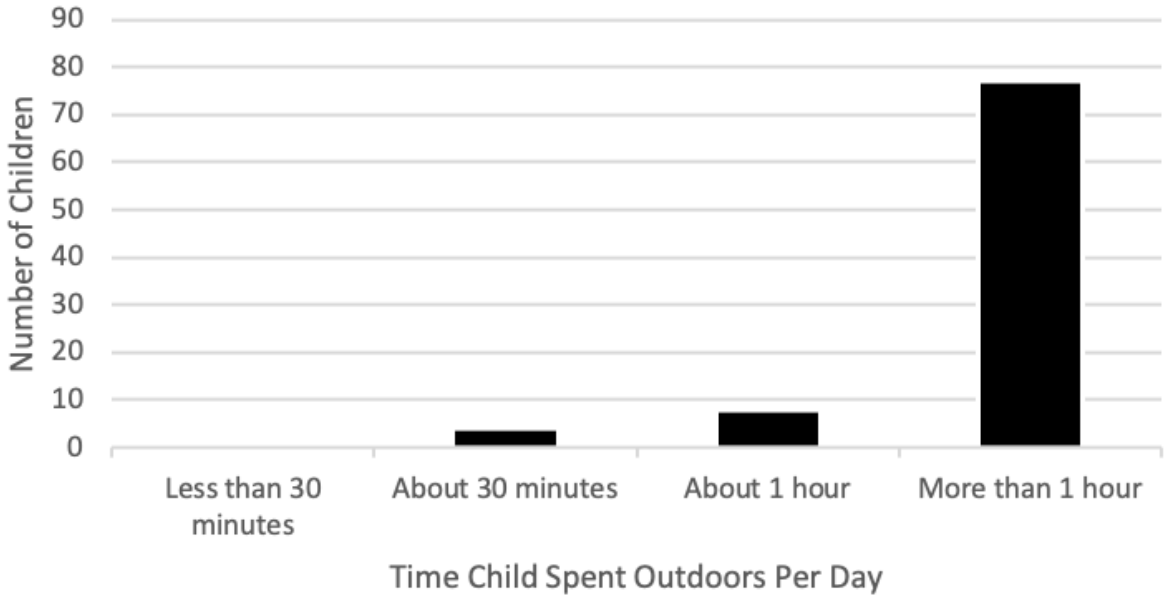
In regard to the five negative comments, one caregiver shared that his/her child needed more structure to be enticed to play outdoors and was therefore less active away from preschool. Two caregivers indicated that their respective child's motivation was reduced to go outdoors without preschool. Finally, two caregivers generally stated how outdoor time had decreased for their child, with one in particular stating that the reduced amount of time was because the caregivers wanted the child indoors more often due to COVID-19.

Sleep

A noteworthy number of caregivers reported that preschool attendance (pre-COVID) positively affected sleep patterns in their children (33 of 76; 43%). According to 35 of the 76 caregivers (46%), attending the preschool program pre-COVID did not associate with any remarkable changes in sleep patterns in their children. Only 4% of caregivers reported that attending preschool negatively affected their children's sleep. (Note that five responses to this prompt were unrelated to sleep and therefore not coded as such).

Figure 2

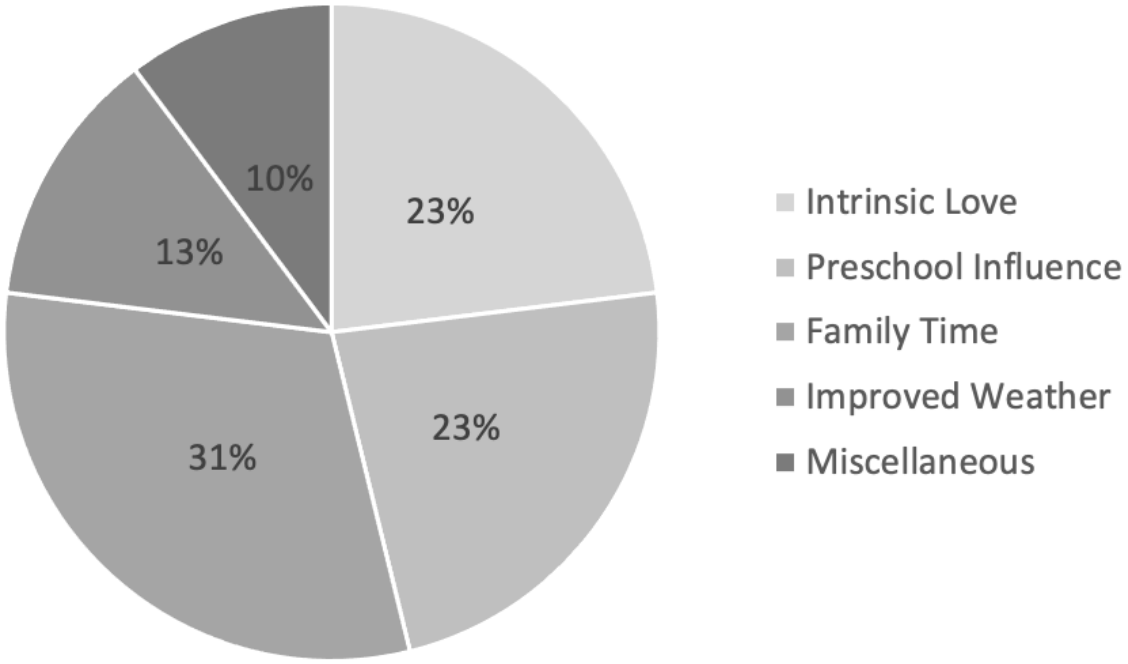
Amount of Time Children Spent Outdoors Each Day After Lockdowns



Note. Prompt question: "How much time per day on average has your child spent outside over the last two weeks?" (in lockdown) (*n* = 89).

Figure 3

Reasons Children Wanted To Go Outdoors

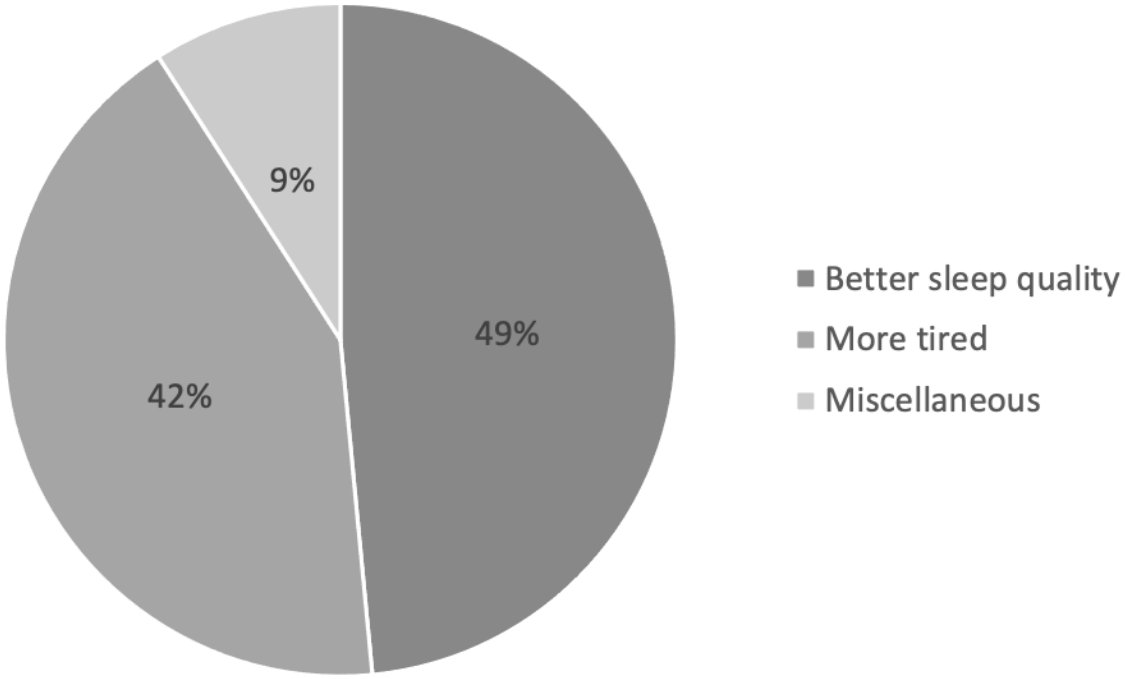


Note. Prompt question: "Share comments about your child's outdoor activity." Thirty-five (35) different caregivers provided positive reasons. Four (4) of these caregiver responses were double-coded, as they mentioned two distinctly different reasons for their child's outdoor activity (39 total responses).

In regard to those who reported positive changes, Figure 4 shows the breakdown of those responses. Of the caregivers who reported positive changes, 49% specifically said their child experienced better sleep quality. Forty-two percent (42%) of the positive comments revealed that children were more tired after a typical day in the nature-based preschool. The 9% of caregivers who reported other positive aspects shared things like quicker sleep latency (latency is the amount of time it takes for a person to fall asleep once in bed). Of the original 4% of caregivers who said their child's sleep was negatively affected, reasons included longer sleep latency and/or that their child had poorer sleep quality (e.g., restlessness or wakings) after beginning the nature-based preschool.

Figure 4

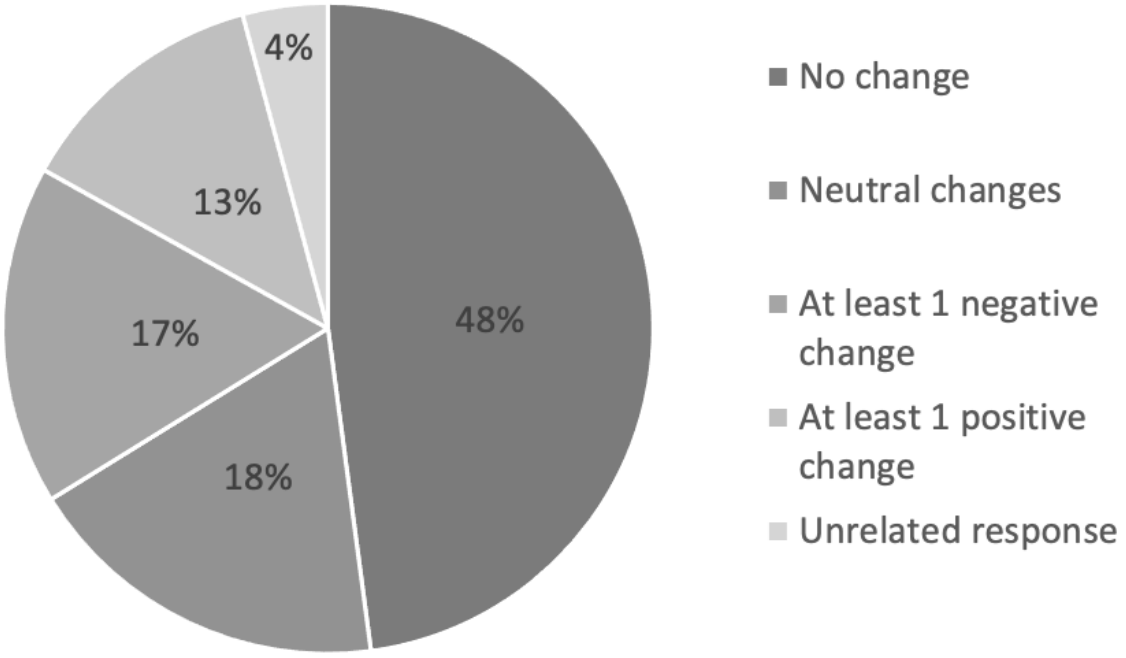
Children's Sleep Quality Attributed to Pre-School Attendance



Note. Prompt question: "Describe how your child's sleep patterns changed as a result of attending [preschool] (before COVID-19)." (*n* = 33)

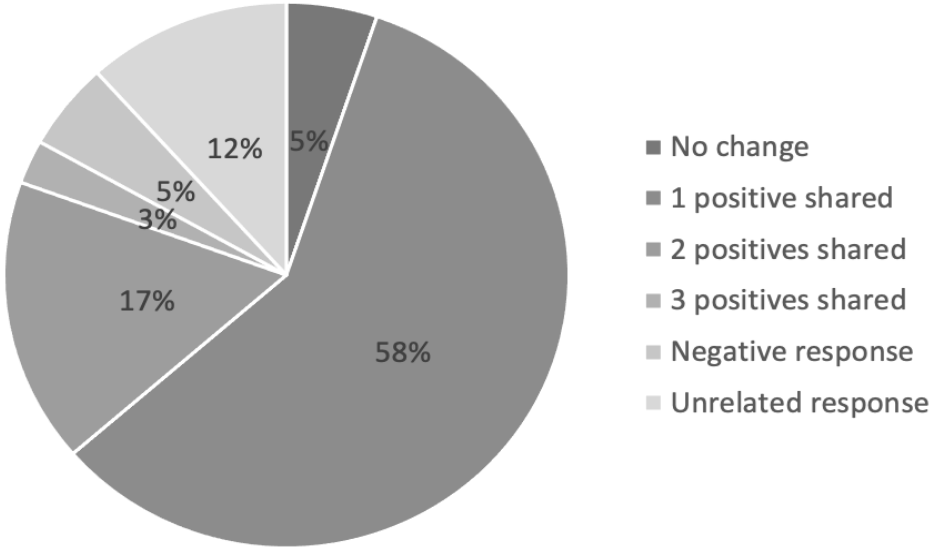
Figure 5 shows results from the question asking caregivers about how COVID-19 and the subsequent lockdowns affected their children's sleep habits. Interestingly, 34 of 71 (48%) caregivers reported no change in their children's sleep habits after COVID-19 and the lockdowns. Of the remaining categories, neutral changes and negative changes were the most prevalent (making up a combined 35% of responses). Positive changes accounted for 13% of the responses, and 3 responses were unrelated to the prompt.

Figure 5
Children's Sleep Quality After COVID-19



Note. Prompt question: "How have the sleep patterns you described changed since the emergence of COVID-19?" (*n* = 71)

Figure 6
Children's Mood and Well-Being As A Result of Preschool Attendance (pre-COVID)



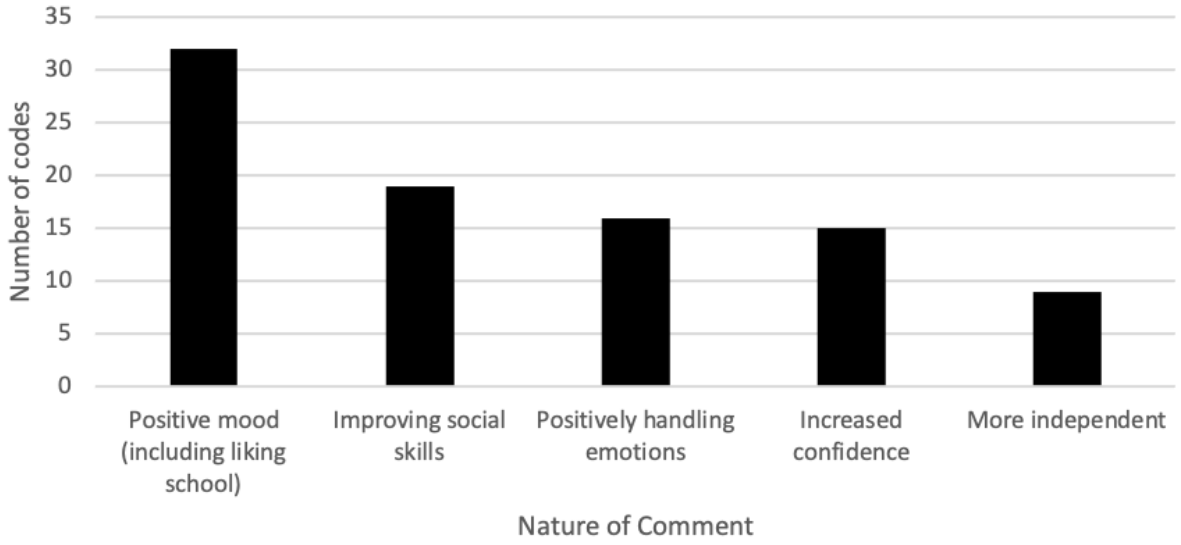
Note. Prompt question: "Describe how your child's mood, emotions, and overall well-being changed as a result of attending [preschool] (before COVID-19)." (*n* = 77)

Well-Being and Mood

Overall, 78% of responding caregivers shared at least one positive comment when asked how attending the nature-based preschool had affected their children's moods before COVID-19 (Figure 6). Four percent (4%) reported no change, and 4% reported negative effects. In terms of positive comments, the specific code counts are included in Figure 7. Caregivers shared comments such as, "He has THRIVED at [the preschool]. He has grown leaps and bounds socially and academically. He is able to *express his emotions more effectively* and confidently." Other positive comments alluded to how much children enjoyed going to school, how their confidence increased, how they were exerting more independence, and how they had developed better social skills.

Figure 7

Specific Positive Themes From Caregivers Regarding Well-Being and Mood of Children (pre-COVID)



Note. Prompt: "Describe how your child's mood, emotions, and overall well-being changed as a result of attending [preschool] (before COVID-19)." (91 total codes; some participants made multiple comments that were coded in more than one category)

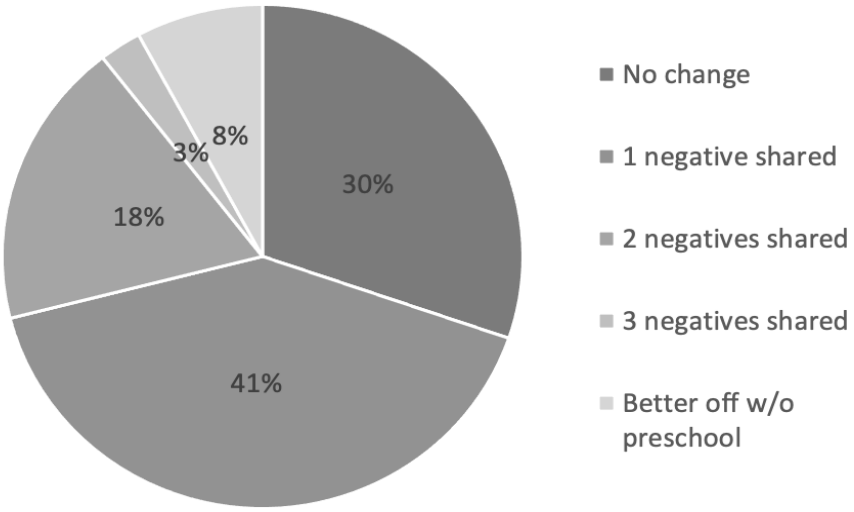
When asked about how COVID-19 and the subsequent lockdown from preschool affected their children's mood, 62% of caregivers (47/76) reported at least one negative consequence (Figure 8). Thirty percent (30%) reported no changes. The remaining 8% stated their children were better off in terms of mood as a result of being at home. In terms of the negative consequences, Figure 9 provides a breakdown of the code counts.

Resources

In terms of utilizing the resources provided to caregivers by the preschool (i.e., the website created for caregivers and their families, Facebook page, Facebook live lessons), approximately one quarter of the caregivers responded to the question (24 of 89). For those who did respond, 20 of 24 (83%) indicated the resources were helpful. Specifically, caregivers mentioned the benefits of the video clips, stories, crafts, challenges, and songs. The remaining four responding caregivers indicated they did not use the resources (17%).

Figure 8

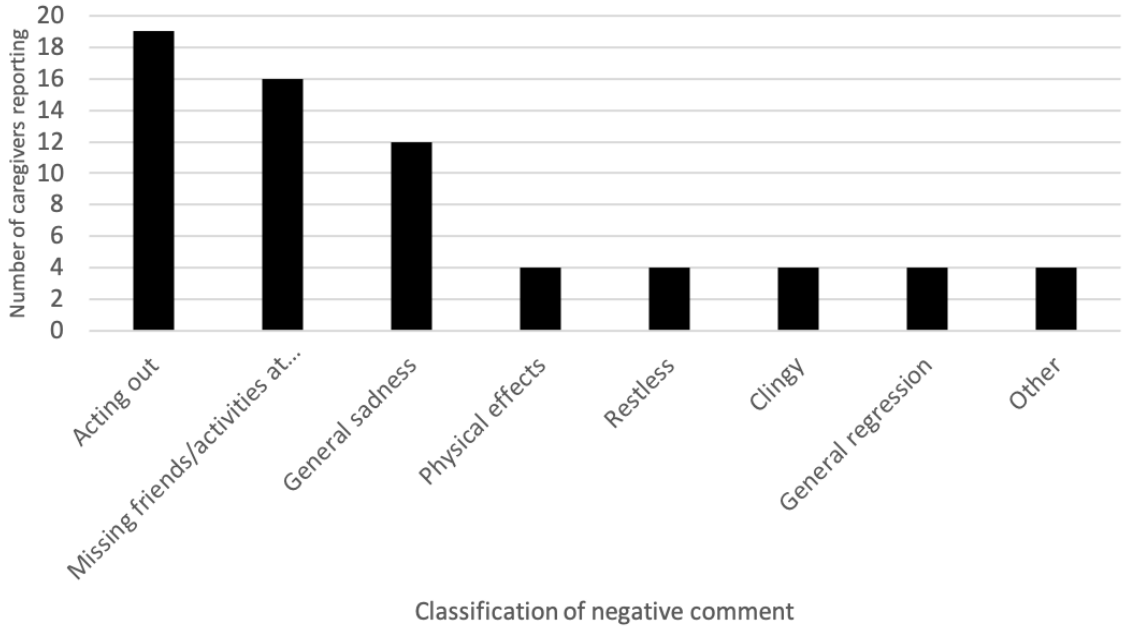
Changes In Children's Perceived Well-Being and Mood (post-COVID)



Note. Prompt: "How have your child's mood, emotions, and overall well-being changed since the emergence of COVID-19?" (*n* = 76)

Figure 9

Number and Categorization of Negative Comments From Caregivers About Children's Well-Being and Mood as Attributed to COVID/Lockdowns



Note. Prompt: "How have your child's mood, emotions, and overall well-being changed since the emergence of COVID-19?" (67 total codes, with some caregivers being double-counted as they provided distinctly different reasons)

Discussion

Outdoor Activity

Before COVID-19, general trends in countries like the US revealed that children are spending less time outdoors. In fact, the National Recreation and Parks Association reported that children spent only 4 to 7 minutes per day in outdoor settings characterized by unstructured play (https://www.nrpa.org/uploadedFiles/nrpa.org/Advocacy/Children-in-Nature.pdf). In contrast, many children spent up to 7.5 hours per day with electronic media. Under COVID-19 restrictions, one might hypothesize that the amount of time spent outdoors would decrease even more as children, along with adults, adjusted to life at home under stay-at-home orders and the like. Furthermore, it seemed reasonable to expect that COVID-19 would adversely affect the well-being of these children as their sleep schedules and/or moods were disrupted due to the rapid changes.

However, findings from the current study indicated that after lockdowns due to COVID-19, most children continued the practice of being outdoors for significant periods of time (Figures 1 & 2). This finding is in direct contrast to other research from around the world about the effects of COVID-19 on outdoor time. For example, in Portugal, studies showed that children under six years of age were less physically active and more sedentary (Cordovil et al., 2021). Similarly, the study from Portugal and one from Ireland (Egan et al., 2021) reported that digital screen-time increased dramatically in young children. Although one cannot make causal claims, it is clear that in the minds of many caregivers in the current study (23%; Figure 3), the nature-based preschool and the habits they instilled influenced their children to spend more time outdoors. In fact, many caregivers (31%; Figure 3) indicated their family time outdoors had increased. So, it is possible that the nature-based preschool had a positive influence on the family to spend more time outdoors with their children. Overall, it seems plausible that the nature-based preschool provided experiences that helped students (and potentially their families) maintain and foster a habit of going outdoors on a regular basis. These findings are in direct opposition to the general trends of preschool children across the globe. However, because of the design limitations of this study, it is impossible to determine a direct connection between being outdoors and increased well-being. Yet, some compelling evidence provided by caregivers suggests a possible connection.

Sleep

Initial attendance at the nature-based preschool (pre-COVID) did not affect a large percentage of children's sleep patterns (46%). However, it is important to note that 43% of caregivers did report positive changes in their child's sleep as a result of starting preschool (pre-COVID). These positive changes included better sleep quality and more tiredness as a result of attending the school (Figure 4). After COVID-19 and the subsequent shutdowns, data indicated sleep was not adversely affected in most children, as 48% of caregivers reported no change in sleep, 18% reported neutral changes, and 13% reported positive changes (Figure 5). These overwhelmingly positive and/or neutral responses are indicative of resilient children who maintained healthy sleep patterns amidst the chaos around them. This finding in no way discounts the 18% of caregivers who reported at least one negative change (Figure 5), but these results are consistent with other research showing that sleep in preschool-aged children was not as affected by COVID-19 as expected. For example, research from Singapore showed that primary and secondary children's sleep patterns were more adversely affected by COVID-19 than preschool children's patterns (Lim et al., 2021). In the current study, it seemed as though starting preschool in pre-COVID times had more of an effect on sleep than did COVID-19 and the subsequent lockdowns.

Mood and Well-Being

Findings in the current study clearly showed that the vast majority of caregivers (78%) believed that nature-based preschool contributed positively to their child's mood and well-being (Figure 6). Children liked school and were gaining social skills as well as learning how to handle their emotions. Furthermore, they were increasing in confidence and independence (Figure 7). These outcomes are consistent with factors that build resilience in children as discussed by Ernst et al. (2019).

In spite of these pre-COVID positive factors, COVID-19 and the associated lockdowns initiated general fears about how the disruptions might affect the overall family structure and specific fears about the potential social-emotional impacts on children (Timmons et al., 2021). In the current study, the negative effects of COVID-19 were definitely detected by caregivers, with 62% reporting at least one negative effect on their child (Figure 8). Similar to research from Australia (Vasileva, 2021), children in the current study often acted out in response to the uncertainty around them (Figure 9). The study from Australia also revealed that young children were extremely worried about permanent change as a result of the pandemic. Perhaps that occurred to children in the current study as well, as many missed friends, missed school, experienced additional attachment, and were generally sad (Figure 9).

Resilience

In addition to the negative outcomes, however, it should be noted that high percentages of reports included both neutral and positive outcomes. For example, 30% of caregivers reported no change in their child's mood after shutdowns (Figure 8), lending credence to the presence of resilience in a portion of the children. In most of these cases, this feeling was attributed to more family time and being with people who were normally not as available due to work arrangements. This finding is consistent with other research, including a study from Turkey that revealed how pandemic restrictions and stay-at-home orders increased caregiver engagement with their children in some cases (Yıldırım, 2021). Similarly, Prime et al. (2020) proposed that resilience of children was often enhanced during the pandemic if family well-being was preserved. It is also interesting to note that some research suggests that children had *more* opportunities to play outdoors due to school shutdowns (Egan et al., 2021). It is unclear whether this is the case for children in this study, but as discussed previously, the amount of outdoor time remained consistently high for these children when compared to other data from around the world. Perhaps the habits instilled in students during the preschool program contributed to this positive trend.

Despite these bright spots, it is disingenuous to claim that the pandemic and subsequent school shutdowns had anything other than a net negative effect on children. Nevertheless, evidence from this study highlights the importance of the preschool experience, as the 62% of caregivers who reported negative outcomes in their child's well-being attributed those negative outcomes to *missing* preschool components (e.g., lack of activities, missing friends, etc.). Furthermore, evidence strongly suggests that children in the current study seemed to resist sedentarism. Perhaps the habits instilled in children who attended the nature-based preschool setting provided a blueprint for them and the adults in their lives to overcome some of the negatives associated with the lockdowns.

Implications

One thing is certain, for those families who were engaged in preschools pre-pandemic, the burden of education shifted from teachers to caregivers in what seemed like the blink of an eye. In response, many caregivers across the world lamented the paucity of training they received for undertaking such a task and the reduced concentration and motivation of their children as a result of the changes (Yıldırım, 2021). Perhaps developing habits of going outdoors in nature-based preschools can help children develop more resilience to these kinds of radical changes. The free play component of the typical nature-based preschool may also be important, as students learn to self-regulate and entertain themselves to some extent. It is interesting to note that the preschool in the current study tried to support caregivers by providing them with resources to keep their children engaged in outdoor activities. We assume many of the caregivers did not use these resources, as this question had the lowest response rate on the survey (24 of 91; 26%). Although it was clear that 20 of the 24 caregivers who did respond used the resources to engage their children, the fact remains that many of the others still saw their children outdoors on a regular basis (Figure 1). Perhaps this finding was due to their children being accustomed to having unstructured time outdoors.

Limitations

Due to the swift nature in which COVID-19 shutdowns occurred in the spring of 2020, researchers made the decision to act quickly in terms of collecting data to capture the essence of how the pandemic had/was affecting children and families in that moment. In some cases, expediency and lack of direct access to children led to study limitations. The

fact that this study relied exclusively upon the perceptions of caregivers whose children attended one preschool is one of those direct limitations. Furthermore, caregiver reports could have been influenced by a social desirability bias and/or by the mental well-being of the caregiver who reported. It should also be noted that researchers did not have any data related to caregivers' schedules and how confounding variables like working from home or changes in caregivers mood and mental health might have affected children's ability or inability to get outdoors. These potentially significant changes in caregivers' schedules and mood may have influenced the behavior of their children, including physical activity, sleep patterns, and mood. It is important to note that parents were specifically asked to separately consider how their child's physical activity, sleep patterns, mood, emotions, and overall well-being changed as a result of attending preschool (before COVID-19) and as a result of the pandemic itself (since the emergence of COVID-19). These questions were specifically designed to help parents focus on any changes in their child's behavior as a result of attending nature-based preschool versus impacts of the pandemic.

In addition, it was not possible to gain access to comparison groups from more culturally diverse settings. Conducting outdoor education research in diverse settings is an ongoing challenge, as according to the recent Outdoor Participation Trends Report, during COVID-19 in 2020, 72% of outdoor participants were White, 11% Hispanic, 9% were Black, 6% were Asian, and 2% were reported as belonging to other identity backgrounds (Outdoor Foundation, 2021). Although the report observed that there has been some increase in the rate of outdoor participation by members of diverse groups, these gains have been in small increments (Hispanic and Latinx (6%), Black participants (.3%)).

Conclusion

It is apparent that children in this study were impacted by the uncertainty of the COVID-19 pandemic. However, this research highlights the potential positive influences that nature-based preschool had on time spent outdoors, sleep, mood and well-being, and resilience. More information about the importance of outdoor play on children's health and development should be disseminated to preschool teachers and caregivers to promote outdoor opportunities for children, as this could ease future disruptions to day-to-day life. Moreover, exposure to the outdoors during childhood has, historically, been a critical factor for the continuation of outdoor participation into adulthood (Outdoor Foundation, 2021). Access to nature-based preschool is one potential avenue for a diverse population of US youth to benefit from the outdoors and learning in nature-rich environments. In the end, these initial findings need to be subjected to more robust scrutiny to determine the potential impacts of nature on the resiliency of all preschool children.

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APPENDIX

Caregiver Survey Questions

Choice Questions

1. Please describe your child's recent level of outdoor activity (in the last two weeks). How much time, on average, do they spend outdoors?
    - Less than 30 minutes a day
    - 30 minutes a day
    - 1 hour a day
    - More than 1 hour a day

2. How has your child's activity level changed as a result of COVID-19?
    - Remained the same
    - Increased
    - Decreased

3. How helpful are the resources that the [preschool] provided to promote nature-based activities?
    - I use them once a week
    - I use them multiple times a week
    - I use them daily
    - I do not use them

Open-ended Questions:

4. Please share other comments you may have about your child's outdoor activity.

5. Please share other comments you may have about the resources.

6. Describe how your child's sleep patterns changed as a result of attending [preschool] (before COVID-19).

7. How have the sleep patterns you described above changed since the emergence of COVID-19?

8. Describe how your child's mood, emotions, and overall well-being changed as a result of attending [preschool] (before COVID-19).

9. How have your child's mood, emotions, and overall well-being changed since the emergence of COVID-19?

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Swedish Early Childhood Educators' Views on Teaching to Promote Connectedness to Nature

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ABSTRACT

Connectedness to nature (C2N) shows a positive relationship with many factors supporting children's health, wellbeing, and development. In addition, C2N has been shown to have a positive relationship with learning about and caring for nature. Despite a long history of outdoor education in early childhood settings in Sweden, C2N is not a concept that early childhood professionals widely use. In this study, we aimed at investigating whether early childhood educators perceived C2N as a valuable idea for their professional efforts. Further, the possible relationship between early science learning and C2N was explored. Specifically, Swedish preschool teachers' view on how natural science teaching as part of the Swedish National Curriculum for Preschool could promote children's connectedness to nature. Teachers from two preschools participated in a connectedness to nature workshop and subsequently reflected on their teaching in a questionnaire and during two follow-up discussions. The data reveals a broad set of content regarding natural science teaching and connectedness to nature in the preschool setting. Results indicate that teachers focus on children's interests, participation, and collaboration in their work with children. Further, results indicate educators perceive their role as someone exploring nature together with children.

***Keywords*:** connectedness to nature, early childhood educators, science education, sustainability

Early childhood is a formative period when children learn basic patterns of relationship with the world around them and understand the meaning and value of things in the context of their families and societies (Pramling Samuelsson & Kaga, 2008). One specific area of interest in early childhood is nature experience and the potential for connectedness to nature. Early childhood has been identified as an important period for connecting with nature based on young children's "heightened susceptibility to acquiring understandings and concepts that impact the individual's life-long attitudes, understandings, and skills" (Wilson, 1996, p. 121). Sebba (1991) notes that children "experience the natural environment deeply and directly, not as a background for events, but rather, as a factor and stimulator" (p. 395). Likewise, Beery et al. (2020) identified a rich mix of factors, not least access and opportunity to nature experience, that help define connectedness to nature. From this general emphasis on the importance of early childhood nature experience is a wealth of literature exploring various aspects of connection, from dimensions of learning (cognitive, affective, and physical) (Ardoin & Bowers, 2020; Chawla, 2015; Christian et al., 2015; Collado and Staats, 2016; McCormick, 2017; Vanaken and Danckaerts, 2018; Kuo et al., 2019; Grzybowski et al., 2020), to place attachment (Beery and Lekies, 2018), to social development (Mygind et al., 2019).

The past twenty years have seen a surge in research and educational and general public interest in the idea and practice of children in nature; for example, consider the growth of local to global organizations such as the Children and Nature Network (2020). Nature preschools, nature kindergartens, and the "greening" of early childhood school

grounds and curricula are proliferating, and many of these programs identify connecting young children with nature as a core part of their mission (Sobel, 2017). The work of the Children and Nature Network is of direct relevance to this current study given the focus on the convergence between public interest and scientific study in practitioner engagement, i.e., translating the widespread cultural interest and scientific study into support and resources for education professionals (Salazar et al., 2021).

C2N in early childhood has been studied from several perspectives, pathways, and potential relationships. For example, much early childhood connectedness to nature studies have considered the situational contexts that influence connectedness, including type of nature available, frequency of exposure, or activity (Lengieza & Swim, 2021). Other studies have considered the relationship between C2N and affective, physical, and cognitive growth; for example, Sobko et al. (2018) considered the relationship between connection to nature and physical activity (i.e., active playtime). One other relationship of interest in the early childhood connection to nature literature is the reported link between experiences in nature and pro-environmentalism as an adult; for example, Rosa et al. (2018) explored whether nature experiences lead to self-reported pro-environmental behaviors and whether the relationship is mediated by connectedness to nature.

Given this interest to better understand connectedness to nature in early childhood and its application across situational contexts, one aspect of consideration is the crucial role played by early childhood educators in supporting child and nature educational efforts. These teaching and learning efforts are related to environmental and natural science content areas, both part of the Swedish Curriculum for Preschool (Swedish National Agency for Education, 2018). Also related is interest in the role of early childhood educators in strengthening the sustainable development concept that is a part of the Swedish Curriculum. There is ongoing interest in what sustainable development educational efforts should look like in a preschool context (Carr & Plevyak, 2020; Pramling Samuelsson, 2021), and further, the links between C2N and education for sustainability (Ärlemalm-Hagsér, 2014).

This article hopes to contribute a broader understanding of C2N, specifically via a greater understanding of the role of preschool educators. The specific research question guiding the study is: How do early childhood educators perceive their role in promoting connectedness to nature for children? In addition, the question of how early childhood educator science teaching could be used to promote connectedness to nature was also explored.

Background

This section will provide a foundation in the Swedish early childhood education context, early childhood C2N, and consider early childhood science education as a possible C2N pathway. Finally, a consideration of the role of early childhood educators in supporting C2N will be presented.

Swedish context

Swedish preschool is a voluntary school form attended by 85% of the country's one-to-five year-olds (Swedish National Agency for Education, 2020). The educational activities of Swedish preschools are regulated by a national curriculum with specific and comprehensive learning goals (Swedish National Agency for Education, 2018). Preschool teachers with a minimum background of an undergraduate university degree are pedagogically responsible for the educational activities within a range of disciplines and life skills, such as science, language, and aesthetics. A defining feature of Swedish preschools is children's learning through play and the promotion of cooperation with others in child-centered inquiry (Jonsson, 2013; Pramling Samuelsson & Asplund Carlsson, 2008). The first kindergartens appeared in Sweden around the year 1900, and since that time, nature has been seen as an essential part of the overall program (Änggård, 2010); the focus was and still is upon nature's multidimensional role, e.g., nature as a topic, nature as a classroom, and nature as play space. In the Nordic nations, the idea that children and nature belong together is strong (Gullestad 1997; Klaar & Öhman, 2014).

Nature as a topic can be noted, for example, in how biology has been part of preschool activities from the start in the 19th century (Thulin, 2016). In the newer versions of the Swedish preschool curriculum, natural science has been expanded to include learning goals from biology to simple chemical processes and physical phenomena (Swedish

National Agency for Education, 1998/2010; 2018). This broadening of natural science is further described in the text of the latest curriculum from 2018; the preschool should provide each child with the conditions to develop an understanding of "relationships in nature and different cycles in nature, and how people, nature, and society affect each other" (Swedish National Agency for Education, 2018, p. 15). Nature as a classroom is explored by Änggård (2010) in her study following an outdoor preschool group over the course of a year. Änggård emphasizes the role of the outdoors as a classroom and a place for free play; for example, she highlights nature as an enchanted world, a fairyland for young children. Further support for nature as a play space, as in a place for free play, can be found in the research literature as well (Åström et al., 2020).

Early childhood connectedness to nature

The broad concept of C2N has been referred to as the "connectedness to nature perspective" by Beery & Wolf-Watz (2014, p.198) to highlight a range of overlapping and deeply related ideas. These ideas originate from multiple disciplines, including biology, environmental education, environmental psychology, and human geography. The concept describes affective, cognitive, and physical human relationships with nature by using terms such as affinity, biophilia, commitment, ecological self, human-nature connection, identity, inclusion, relatedness, sensitivity, and topophilia (Bragg, 1996; Chawla, 1999; Clayton, 2003; Giusti et al., 2018; Ives et al. 2017; Kals et al., 1999; Mayer & Frantz, 2004; Nisbet et al., 2009; Palmer, 1993; Sampson, 2012; Schultz, 2002; Stedman, 2002; Sward & Marcinkowski, 2001; Wilson, 1984). Many of these ideas have been carefully studied and tested using psychometric scales such as the Connection to Nature Scale (Meyer & Frantz, 2004), the Nature Relatedness Scale (Nisbet et al., 2009), and Inclusion of Nature in the Self Scale (Schultz, 2002).

Interest in C2N in early childhood stems partly from research that identifies early childhood nature experience as part of a potential C2N lifespan trajectory (Well & Lekies, 2006). In addition, early childhood C2N studies are intertwined with a wealth of research exploring the benefits of nature experience in the early years (Chawla, 2020). Recent research to explore the unique qualities of early childhood nature experience described early childhood C2N in the following way:

> …connection to nature in two- to five-year-old children involves freely chosen personal elections to interact with nature. This interaction may take many forms, including bodily movement in nature, the investigation of nature phenomena, place exploration, and free play. During this period of rapid growth and change, young children's curiosity, interest, and desire to move and explore in nature is coupled with sociocultural learning, given young children's dependency on adults" (Beery et al., 2020, p.16).

Specifically, Beery et al. (2020) highlighted six definitional elements of C2N in early childhood, and Chawla (2020) detailed six specific experiences/factors that contribute to C2N in young children (see Table 1).

Table 1
Factors contributing to early childhood connection to nature

From Beery, Chawla, & Levin (2020):	From Chawla (2020):
• Special qualities of young children • Cognitive interest • Emotional response • Bodily movement • Multisensory experience • Place-based • Children's agency • Related to empathy • Context dependent	• Access to nature • Time in nature • Positive engagement with nature • Childhood 5-12 • Sustainable practices • Adults who promote engagement with nature and empathy for living things

Previous research in early childhood C2N supports these elements as critical aspects of C2N, for example, agency (Ärlemalm–Hagsér, 2013); place and context (Beery & Lekies, 2018); multidimensionality (Barrable & Booth, 2020; Beery & Jørgensen, 2016); unique qualities of young children (Ernst & Burcak, 2019).

The growing importance of early childhood C2N is evident in both support for connectedness to nature as a distinct goal in early childhood education (Barrable, 2019), as well as via increased efforts to measure it. As noted in Salazar et al. (2020), having the ability to assess or measure connection to nature could be useful to educators, natural area managers, community planners, and others because this concept is both an outcome of experience and learning and a potential indicator of mental health, well-being, and pro-environmental behaviors. In response, many tools have been created to assess connection for research purposes (Restall & Conrad, 2015; Tam, 2013); the wealth of such tools is in part a testament to efforts to create age and or program-oriented relevant measures (Salazar et al., 2020). A 2018 North American Association for Environmental Education workshop set about to review these tools and support the availability of the tools for practitioners. The outcome of the workshop and subsequent follow-up resulted in the creation of a practitioner guide (Salazar et al., 2020). The guide provides a means to assess appropriate strategies, improve existing programs, and better understand the effectiveness of efforts to support connection to nature. The early childhood section of the guide features the Biophilia Interview (Rice & Torquati, 2013) and has been translated into Swedish for use in Swedish early childhood settings (Beery et al., 2020).

C2N and sustainable behavior

An important aspect of C2N is research showing a significant relationship between children's nature experiences/connectedness to nature and behavior. In the literature of environmental education and related fields, terms such as pro-environmental behavior, responsible environmental behavior, stewardship behavior, and sustainability behavior are often used to describe human actions informed by environmental awareness, knowledge, and concern (Barrera-Hernández, 2020; Mullenbach et al., 2019; Sivek & Hungerford, 1990; Steg & Vlek, 2009). For this study, we will use the term sustainability behavior (Barrera-Hernández, 2020), given the focus on early childhood education for sustainability (ECEfS) in the Swedish preschool setting (Engdahl & Ärlemalm-Hagsér, 2014; Borg & Pramling Samuelsson, 2022). This connection to behavior and the idea of a lifelong trajectory are relevant given that C2N in childhood has been described as a pathway for developing lifelong interest, concern, and potential for sustainable behaviors on behalf of nature (Chawla, 2020). For example, Charles et al. (2018) highlight how children's opportunities to connect with nature are important for biodiversity conservation. Another recent example is Giusti's (2019) research with children defining human–nature relationships using relational language such as "systems of meaningful relationships between mind, body, culture, and environment…" (p. 19). He reminds us that these relationships can support or impede efforts toward sustainability. Additionally, Sachs et al. (2020) suggested that people must have positive experiences with nature in childhood to instill pro-environmental attitudes in adulthood. This outcome, coupled with studies showing positive relationships between environmental values and behaviors (e.g., Liu et al., 2020; Rajapaksa et al., 2018), reminds the importance of early childhood nature experience as part of a complex progression.

C2N and early childhood science education

A turn to early childhood science education is also helpful for broadening an early childhood focus on C2N, in part based upon the curiosity of everyday experience of nature as a driving force for both science learning and C2N (Ernst & Burcak, 2019; Kim et al., 2019; Spektor-Levy et al., 2013; Thomashow, 2002). Nature experience and new knowledge about nature do not satiate an individual's curiosity but instead fuels curiosity and nourish it in new and broader directions (Blair, 2009; Lindholm, 2018; Rios & Brewer, 2014). Lindholm (2018) explains this dynamic between wonder between curiosity and wonder in the context of early childhood:

> Wondering and curiosity accordingly reflect somewhat different modes of questioning and stimulate exploratory joy from different positions. Curiosity remains in the space of terms, concepts, and causality. Wonder emerges from a wordless experience of something's existence. And, while wonder is more ignited by perception, curiosity is more ignited by reflection (p. 990).

Eshach (2006) argues that children's natural interest in observing and thinking (curiosity and wonder) about nature is one reason to introduce science early in life. Eshach describes science as two types of knowledge: domain-specific (scientific facts about different phenomena) and domain-general knowledge (the scientific process in terms of observations, hypotheses, experiments, and discussions). In a description of emergent science, Siraj-Blatchford et al. (2001) suggest that science in preschool should emphasize the process over facts. Children should be encouraged toward curiosity and wonder, i.e., observe, explore, and discuss the nature around them. Building on this, it can be argued that the two knowledge domains should not be polarized since observations and explorations are inevitably directed towards content that could be explored based on child curiosity.

Role of the teacher

Given the focus of this study on early childhood educators' perception of their role in promoting connectedness to nature for children, and further, their view on how their science teaching fits with connectedness to nature, we turn to environmental and science education literature highlighting the role of the educator. One aspect of the role is the educator's perspective of the child. Children are considered actors in their own lives; thus, the natural science content they meet should be based on direct experience, curiosity, and personal meaning (Thulin, 2011). This child-centered perspective demands a certain level of educator confidence in allowing children to be principal actors in their learning; they need both opportunity and freedom to be in settings that may allow for wonder, curiosity, and the development of a relationship with other living things.

A key variable in whether such freedom to explore nature and natural science phenomena is allowed appears to be educator comfort or confidence. Fridberg et al. (2021) showed how preschool teachers' long-term professional development program improved their confidence in teaching science. Torquati et al. (2013) emphasized providing training experiences in nature that help teachers develop confidence in implementing activities in nature with children. Another aspect of confidence is teacher comfort with the logistics of being outdoors and active with children. Ernst and Tornabene (2012) and Ernst (2014) and found that efforts to promote early childhood educator use of outdoor settings should focus on reducing barriers (such as adequate time, safety, and proximate accessibility). Teachers' knowledge of science content is an important prerequisite for children's science learning (Siraj-Blatchford et al., 2002; Yoshikawa, 2013), and limited knowledge is directly linked to teachers' competence and confidence to teach science (Fleer, 2009). Many professionals and pre-professionals describe an uncertainty when teaching natural science, connected to a lack of content knowledge. This anxiety is confirmed by other researchers (Kallery, 2004; Greenfield et al., 2009; Torquati et al., 2013; Fridberg et al., 2018).

Methods

An iterative qualitative research plan exploring the early childhood educator perspectives is presented in this section. The methodological use of in-service training as an arena for this research is motivated by a study supporting the value of teacher in-service as a critical element in early childhood and environmental education contexts to introduce or support quality educational practices (Álvarez-García et al., 2015; Sandberg et al., 2007).

Case study

A case study is based on exploring two collaborating early childhood centers as a bounded system. Concrete, context-dependent, and in-depth knowledge were sought through a series of group interviews and follow-up discussions (Crowe et al., 2011). A case study approach is appropriate in this situation, primarily based on uncertainty regarding the phenomenon, e.g., unique aspects of early childhood sites and programs (Yin, 2009). Nonetheless, it is hoped that the results will be transferable so far as the detail provides an opportunity for the reader to decide if the context and outcomes are appropriate for application to other sites (Blomberg & Volpe, 2019).

3.2 Data collection

Participants in this study were all professional educators (preschool teachers with university training and childcare professionals without university training) from two preschools in the south of Sweden. They were asked to

participate in the study based upon previous participation in a credit-based professional development science education course; participant experience working with natural science in preschool was viewed as a valuable asset in discussions about connectedness to nature. During a digital workplace meeting for both preschools combined, the researchers conducted a workshop on connectedness to nature. The workshop included C2N background, cultural relevance, and research applications. Specifically, a presentation of C2N theories and a review of the benefits of nature experience for young children were presented. Moreover, a review of how nature experience has historically played a prominent role in Swedish early childhood education accompanied this introduction; the Swedish translation for C2N was used (samhörighet med naturen) as part of efforts to create a cultural bridge to connectedness. Finally, C2N in early childhood/early childhood education research and a review of the recent development of practitioner-friendly applications of C2N measurement tools were also presented. For example, the adapted (translated for language and culture) Biophilia Interview tool (Rice & Torquati, 2013) was presented as a way in which early childhood educators in Sweden could explore C2N with their students if it fit with practitioner interests and early childhood education context.

The C2N concept presentation was followed by discussions in breakout rooms in Zoom for each work team; there was a total of eight work teams consisting of 3-to 4 preschool teachers/childcare professionals in each room. The discussions were guided by a written questionnaire: What opportunities do we see in our teaching to promote connectedness to nature for children? The preschool educators were asked to give concrete examples for the questions, and they were asked to discuss both broadly and concerning natural science and the didactic questions What? How? and Where? The reason for this was two-fold. First, Swedish preschool teachers often use planning documents where What? How? and Why? are central focal points about a planned activity; they are therefore familiar terms for use in reflection. Since Why? was already determined (to promote connectedness to nature), the educators were asked to discuss the most suitable place for the teaching instead, i.e., Where?

The second reason for asking the educators to discuss *What?* and *How?* was based on the preschool educators' previous participation in the science-focused professional development course. During the course, developmental pedagogy (Pramling Samuelsson & Asplund Carlsson, 2003) was the theoretical perspective used concerning science teaching. In this theory, learning is viewed as always directed at something specific. This "something" can be described in terms of the learning object (*What?*) and the enacted learning process (*How?*) (Pramling Samuelsson & Asplund Carlsson, 2003). Thus, this developmental pedagogy framework was deemed accessible for the preschool educators and appropriate to the posed questions. In addition, the questionnaire included a second question: *What teaching opportunities have we observed in children's free play in nature?* While related and of research interest, the analysis of that question is beyond the focus of this article.

Following the work-team discussions and responses to the questionnaire, either online or on a paper version (dependent upon group preference), a joint discussion took place where the groups shared their thoughts. This initial joint discussion was recorded with permission from the participants. Preliminary results from the questionnaire and the initial discussion were reported to the participants at a second workplace meeting four months after the first. Feedback was presented (as concrete examples given by the participants) for each of the three questions What, How, and Where in their answers to the question 'What opportunities do we see in our teaching to promote connectedness to nature for children?'. The participants' examples were not categorized in the presentation but listed. The lists included, e.g., 'What' aspects such as 'understanding and respect for animals,' 'air, 'weather, and 'How' aspects, e.g., 'walks in the neighborhood,' 'exploring,' and 'talks.' The educators discussed these results, and this second, follow-up discussion, was recorded. The recording and other aspects of the data collection adhered to the ethical guidelines of the Swedish Research Council (2017), and all participants were informed of their rights, both written and verbally (Swedish Research Council, 2017).

Analysis

In the first step, the initial discussion was transcribed, and the researchers performed content analysis (Bryman, 2016) for both questionnaire and the discussion. As described above, these preliminary results were reported back to the participants for the second round of discussion. In the next step, the follow-up discussion was transcribed. The analysis of the transcripts was based on earlier work describing childhood experiences influencing

connectedness to nature (Beery et al., 2020; Chawla, 2020); this previous research identified multiple elements that have been used in this current study as a framework for analysis (See Table 1). After that, the initial discussion was re-analyzed, and both researchers analyzed the follow-up discussion. A high level of agreement was found between both researchers' analyses, and variations were discussed to reach a consensus.

Not all elements, or categories, could be identified in the transcripts from the initial and follow-up discussions, and the absent categories were therefore left out in the results section. Further, the categories' Emotional response' and 'Related to empathy' were merged to create 'Emotional response.' It was not easy to separate these related ideas, for example, when categorizing what the preschool teachers expressed about children's concern for nature. We recognize significant overlap in our data, as evidenced in participant comments that we coded into multiple themes.

Results

In the following section, the preschool teachers' expressed thoughts concerning the above-described factors are presented and summarized under four thematic headings based on the analysis:

- *Children's cognitive interest in focus*
- E*ducators' role in promoting engagement and empathy for nature*
- *Children's agency as the basis in teaching for connectedness to nature*
- *Context and place-based learning.*

We provide data examples from all of the data sources to explain and support the themes of the analysis.

Children's cognitive interest

The theme' cognitive interest' contains the participants' thoughts on possible nature-related content in focus: the 'what' aspect of the teaching. It also contains the participants' thoughts on teaching arrangements, that is, 'how' the teaching should be enacted to promote interest for, learning about, and connection to, nature. Keywords looked for during analysis were specified content areas (where the wording' content area' is chosen since 'subject' is related to the school curriculum and not to preschool in Sweden) such as chemistry, physics, and biology. Other keywords were specified phenomena within these areas, e.g., water or raising vegetables. A more general mention of science and what enables interest and learning is also part of this theme.

The participants were asked to reflect on possible science content, which made their prior experience from the professional development course in science education evident in the data. They gave examples in both the questionnaire and in the discussions related to chemistry and physics (e.g., water phase changes, objects sinking or floating, exploring air), which were the course's main topics. However, most examples involved biology or other physical sciences, e.g., raising vegetables or butterflies, working with bees, or weather and seasons. The participants reflected on being originally more familiar with the biological aspects of science yet developing a greater awareness and knowledge about chemical processes and physical phenomena. They also stated that they perceived the biological content as closer to children's interest than chemical and physical phenomena are, as expressed by the following two participants:

> "It's easier with biology because it's very much in the children's interest to find animals to take care of and so on."

> "I don't know, it feels as if they are born with a wish to take care of animals and nature."

The participants also related the biology content to sustainability practice, yet another content area identified in the analysis. They discussed how children should learn about how people, animals, and nature interacted and gave examples from work with bees and other outdoor activities:

> "What should we do with our apple cores? Well, we could leave them to the animals, and when we visited the place a couple of days later, we found that the animals had eaten it. We also found garbage and collected it to leave the nature in good condition and talked about littering. The children were so engaged in this."

When reflecting on *'How'* to develop children's cognitive interest, the participants emphasized the children's previous experiences and interests as a starting point when choosing content. In one participant's words: "Many children were interested in killer slugs, so we of course started from there." Prominent in the answers was also the concept of a joint exploration where teachers learn and find answers with the children. They also viewed children as essential learning resources for each other, which is reflected in the following two statements:

> "I'm thinking that the children are teachers for each other and that the conversation is important in the group, to make sure they share their experiences in an exchange."

> "You could have a broader perspective if you are in a group. Someone else may think differently than I and if I'm in a group and get another angle from someone else, then it enriches me and maybe I can think outside the box too."

Similarly, participants gave examples of how some children's explorations of killer slugs in the preschool yard immediately drew the attention of other children, whereby the more experienced children explained about the slugs to the others. Present in the data material is also a view that teaching of a content area should start from a small perspective, with young children:

> "I'm thinking that when children see growth and growing on a small scale, then they easier understand growth and growing on a larger scale."

The educators' role in promoting engagement and empathy for nature

The analysis identified vital terms defining the theme of engagement, including fascination, curiosity, and initiative. The results that helped identify and define empathy included reference to the human relationship with nature and understanding and respect for animals. Together, defining these terms in the results helped identify the theme of *The educators' role in promoting engagement and empathy for nature*, which was prominent in the results. This theme was reflected in several subthemes, including general engagement, specific topic engagement, and the process of engagement. An example of general engagement was visible in participant comments: "Our engagement is super important..." and comments describing how engagement from teacher to student is contagious.

From a general sense of engagement to engagement in specific scientific topics were visible in comments from participants such as: "We have just begun to work with bees as we work with natural science teaching...and there we will make sure the idea of how nature and people impact each other, and it is obvious in our work with bees." Beyond both the general and specific focus of engagement, the teachers are interested in the process of engagement. For example, consider the following shared ideas: "We believe it is important that we have variation in the instruction, as children learn in different ways and adults teach in different ways. Moreover, another example of engagement in the process is: "But we cannot have a pedagogical planning that is so well planned that we do not have room for children's questions and initiative" and relatedly, "...through open questions from the children that guide us forward." This dynamic between making room for child agency, i.e., children self-directing their outdoor time vs. planned teach-based instruction and activities, is evident.

The theme of empathy, as roughly defined above as closely linked to understanding and respect for animals, emerged throughout the data. Consider these examples:

> "So there was actually no one who thought they were disgusting." (*About killer slugs*)

> "I think that children developing respect for living things is good for the future, important that our small children think so."

> “When a small child has been able to raise a butterfly, they gain a perspective on certain things that matter in the big picture.”

Further, numerous comments about the emotional response to nature had a clear link to the idea of empathy; consider these examples:

> "So, I think that we are a part of nature, and I felt it strongest when I had my baby, that I was not so far from other animals in the process."

> "It lies in a child's interest that they find animals and take care of them."

In relation to the participants comments about their own connectedness to nature, they also reflect on their teaching and if they indeed talk enough with children about emotions awoken by nature:

> “Are we good at mediating the feeling? I’m thinking now that we discuss feelings. Do we use it when we talk to the children? “What emotion do we get from this situation?” Maybe it’s a concept we don’t use as much?”

Children’s agency as the basis in teaching for connectedness to nature

The participants gave several examples of children’s thoughts, values, and choices visible in their actions. These actions could be verbal and in the form of questions from the children:

> “They asked new questions, that gave them more knowledge, and then there are new ideas all the time from the children. About what they want to explore. And then it’s important that we teachers listen and explore together with them.”

Other examples include children expressing awareness about littering and their concern for nature. The participants´ examples include children yelling “Garbage in nature, garbage in nature!” when they have found something on the ground, or as one participant expressed it:

> I was working with the youngest today and then one of them comes to me: “Band-aid, band-aid, band-aid!” He was very concerned about having found a band-aid in the yard.

The participants also reported how parents had given examples of how their children tried to influence them towards more sustainable habits. The parents described their children as ‘police officers,’ keeping track of their actions so that no animals will be hurt, for instance. One participant reflected on how this may lead to parents acting in more sustainable ways:

> “According to the parents, they talk a lot about it [bees] at home, which may affect the parents. When we were kids, we just rolled down the car window to throw out the old gum, but maybe your child can raise your awareness about sustainability and science.”

The children also transfer sustainable behavior between the home and preschool. One participant explains how a child came from home with apple cores in a small bag after he had taken part in different gardening projects at preschool. He had ‘forced’ his parents to give them to him to raise apples in preschool. The participant interpreted the child’s action as an example of new knowledge gained and expressed.

Context and place-based learning

Context, in part a response to the didactic question of *Where?* is defined through the results as the outdoor setting or outdoor classroom; this context was referenced in many similar ways, such as "outdoors," "near-school setting," or "outdoor environment." Participants discussed this outdoor context in very favorable terms, for example, comments such as: "We can do as much outdoors as we can indoors." Prevalent in the data is also the idea that science education for connectedness to nature can be conducted *both* outdoors and indoors, and that the outdoor experience can bridge to indoor learning experiences. The participants give examples of taking material such as play-dough or computer tablets outside and they also talk about transitions between teaching outdoors and indoors. Examples of this include starting to grow tomatoes outside before taking them in to see if they can grow just as well in a window, and exploring ice outdoors before continuing to explore it indoors.

Participants also highlighted a professional use of outdoor spaces for specific objectives; for example, multiple participants described using the outdoors without any of the toys or extra materials "...to be on the school grounds without taking toys, fantasy gets a real lift!" and "...play was a completely different activity without preschool materials, just using nature as the material for play."

Two other subthemes within the broad theme of context were child behavior and place, and place-based awareness and connectedness to nature. Participant observation of how child behavior showed a relationship to place, for example:

- "...the meeting with the children in the different environments actually becomes different. The children may be able to… play with others and with other material than what you only have in the schoolyard"
- Children that use to play with certain children play with other children in different environments.
- The idea that places of play were a window on the world also elevated the topic of place; consider this comment: "I think that if children can learn in these small outdoor spaces, they will be better able to see the bigger perspective on earth."

A place-based subtheme was based on participant awareness of repeated use of outdoor sites, for example: "...we always went to the same site, that way we could follow the development of the seasons." Related to the reality of seasons in the outdoor context was one participant's description of children's study of water and how winter provided access to ice.

Discussion

As noted in the background, previous research has shown that connectedness to nature shows a relationship with many positive factors for children's health, wellbeing, and development (Chawla, 2020). Moreover, while the specific concept of connectedness to nature is not well integrated into the early childhood education profession in Sweden, the importance of nature experience in Swedish preschools is well documented (Änggård, 2010). An interest in coupling C2N with natural science learning was based upon research showing a relationship between C2N and environmental knowledge (Chawla, 2020). In this study, we aimed to investigate Educator perceptions of the idea of C2N and, further, one possible pathway to support C2N; Specifically, Swedish preschool teachers' view on how natural science teaching, part of the national curriculum for preschool, could promote children's connectedness nature.

This study is a small puzzle piece of a significant endeavor, i.e., a better understanding of the human relationship as part of nature. With the world facing critical socio-ecological challenges such as biodiversity loss and climate change (UN, 2021), contributions to greater environmental knowledge and sustainability behavior are of great value. This current research exploring early childhood teachers' perception of connection to nature and a potential link to natural science education may support a better understanding of the development of sustainability behavior.

This study provides a snapshot of early childhood educators' perspectives on supporting connectedness to nature. While C2N was not a familiar term to participants prior to the workshop, the underlying foundation of nature

experience was part of the educators' perceptions of their role as educators. For example, educator confidence in using outdoor spaces was identified; participants viewed outdoor spaces as necessary in their educational efforts. This confidence in their role as outdoor educators and use of outdoor spaces was not a result of our discussions with teachers but rather a reminder that this perspective is valuable to ongoing early childhood C2N efforts. Promoting access to nature experience, allowing nature play, and developing science in nature were all discussed and celebrated as essential aspects of the early childhood educator role.

This study provides a snapshot of early childhood educators' perspectives on supporting connectedness to nature. While C2N was not a familiar term to participants prior to the workshop, the underlying foundation of nature experience was part of the educators' perceptions of their role as educators. For example, educator confidence in using outdoor spaces was identified; participants viewed outdoor spaces as necessary in their educational efforts. This confidence in their role as outdoor educators and use of outdoor spaces was not a result of our discussions with teachers but rather a reminder that this perspective is valuable to ongoing early childhood C2N efforts. Promoting access to nature experience, allowing nature play, and developing science in nature were all discussed and celebrated as essential aspects of the early childhood educator role.

Results from this study were analyzed using the current understanding of early childhood C2N as a guide for organizing the data. As presented in the results, the data was organized into four themes relevant to understanding early childhood C2N:

- Children's cognitive interest in focus
- Educators' role in promoting engagement and empathy for nature
- Children's agency as the basis in teaching for connectedness to nature
- Context and place-based learning.

Participants saw these elements of their work as complimenting the idea of connectedness to nature as evidenced in their reflections of their educator role, thus addressing the research question. A quick review of each theme in the context of previous research highlights outcomes.

An emphasis on process, curiosity, and wonder in early childhood science education (Blair, 2009; Lindholm, 2018; Rios & Brewer, 2014) aligns well with participants' reflections about children's cognitive interest and engagement with natural phenomena. Such interest—wonder, and curiosity have implications for supporting C2N and science learning.

The educator role regarding empathy for nature emerged via participant discussion of respect and care for nature they described as a part of their outdoor experiences with young children. The importance of empathy regarding early childhood C2N, as described by Chawla (2020), is also present in many of the definitions of C2N related concepts as described as being a part of the C2N perspective (Beery & Wolf-Watz, 2014), for example, the emphasis on the affective relationship with nature as described by Mayer and Frantz (2004). Except for the participants' thoughts on the importance of their own engagement for to promote children's engagement, there were also reflections about the actual process of becoming engaged in something. Here, the participants emphasized the meaning of a varied teaching, for both children and teachers. In the words of a participant: "We believe it's important to make use of variation in the teaching, because children learn in different ways plus, we grown-ups teach in different ways.". This idea of a varied teaching is part of the developmental pedagogy, where variation and highlighting children's different experiences in group discussions are considered a foundation in preschool teaching (Pramling Samuelsson & Asplund Carlsson, 2008).

The importance of support for children's agency as expressed by participants can be traced back to the definition of early childhood C2N presented as background to this study, which includes this phrase: "…connection to nature in two- to five-year-old children involves freely chosen personal elections to interact with nature…" (Beery et al., 2020, p.16). The importance of children's agency also provides a strong example of how the themes from the analysis showed considerable overlap; for example, cognitive interest is predicated on children's active choice based on their engagement with nature, places, or phenomena. The results also show how sustainability behavior was discussed

by participants, e.g., the themes of empathy and agency. The discussion highlighted children's self-elected behaviors on behalf of respect and care. The analysis also revealed tensions between the teachers' promotion of children's choices about 'being' in nature while at the same time having learning goals to strive for as described in the curriculum. This tension, or dilemma, is important to reflect upon in relation to teaching for C2N. As a preschool teacher, you are indeed expected to teach and give children the possibility to learn about nature. At the same time, and aligned with the C2N-literature, there is another value in giving children time for wordless wonder and to just 'be' in nature, without learning goals. Our perspective is to not polarize between teaching and 'just being' in nature. Spending time in nature with a group of children with an aim to just 'be' without necessarily putting words to, or draw conclusions from, the children's nature experiences may lay the foundation for future teaching. In other words, we would like to suggest a balance between a deliberate teaching on some occasions (e.g. put words to, directed observation, and discussion of aspects of nature) and on other occasions just being in nature, without a pronounced learning in focus.

The emphasis on place-related ideas in participants' descriptions of outdoor play and activity is supported in the literature of C2N (Beery & Lekies, 2018). Further, the importance of place as a factor in early childhood nature experience is well documented (e.g., Duhn, 2011; Nxumalo, 2019). Participant's consideration of nature as a learning place or the outdoor classroom as necessary also resonated in their comments and is well supported in the research literature (Beery, 2020; Dennis et al., 2014; Lindfors et. al, 2021)

Participants in this study saw the idea of C2N as fitting into the work they are doing. Teachers showed confidence in the use of the outdoors for structured activity or free play. Participants acknowledged the importance of choice for the children and subsequent opportunities to use child engagement to guide their work with the children. Participants saw natural science education intertwined with the idea of C2N, most notably regarding the opportunity for promoting child wonder and curiosity. Time in nature for free play and exploration not only serves C2N but is a gateway for natural science learning.

An analysis of the results identifies C2N as a valuable idea to facilitate professional discussion. The multidimensionality of the C2N perspective fits very well with the whole child view of early childhood education in Sweden.

Implications and Conclusion

Based upon the methods and results of this study, three critical implications for teacher practice have emerged; one is the value of in-service C2N training. C2N is not a well-known concept in Swedish preschools, and the discussion around it indicated interest and curiosity. The methodological approach of using teacher in-service for training and reflective discussion of practice was highly effective for both sharing new information and gaining insight on professional practice. Both the research team and the teacher participants had the opportunity to share, learn, and reflect. Also, the arrangement with an initial discussion, followed by a second discussion about the study's preliminary results, showed a deeper reflection and more examples given by the teachers during the second meeting. This is in line with research pointing to the benefits of professional development for a whole staff and over time as compared to just letting one teacher participate, expecting them to re-tell the content to their colleagues (Timperley, 2019). This process further supports previous research highlighting the value and importance of in-service teacher training (Álvarez-García et al., 2015; Sandberg et al., 2007).

A second critical implication of this study is the value of C2N research and literature to provide support for educators' desire to allow children to "be" in nature, i.e., allowing children to make decisions and undertake self-selected activities. The final critical implication is the role C2N to support the ever-growing emphasis on education for sustainability in Swedish preschools. Education for sustainable development has been further strengthened in the newest version of the Swedish preschool curriculum. The curriculum stresses that preschool education should lay the foundation for a growing interest in environmentally sustainable development (Swedish National Agency for Education, 2018). C2N can help establish the foundation for the awareness, knowledge, and intention to act that is necessary for a sustainable societal transition.

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The Influence of Significant Life Experiences on the Teaching Practices of Early Childhood Educators in Traditional and Nature-Based Preschools

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ABSTRACT

The first purpose of this qualitative study was to explore self-reported significant life experiences of early childhood educators to determine whether experiences of traditional pre-K educators differed from those who taught in nature-based programs. The second purpose was to explore whether these experiences influenced their teaching practices. Ten traditional pre-K teachers and ten nature-based teachers were interviewed to obtain reports on whether their early experiences influenced their teaching practices. The nature-based participants were reportedly more influenced by early outdoor experiences and the traditional pre-K participants were reportedly more influenced by role models. The findings from the nature-based participants aligned with prior research on significant life experiences. That is, those who have memories of early outdoor experiences continued to exhibit concern for the environment in their adult lives emphasizing the importance of outdoor experiences for all young children.

Keywords**:** significant life experiences, teacher influence, teacher preparation

Many people reminisce about their childhoods with most of their stories either based on experiences outside in nature or with significant people. However, their nostalgia about outside experiences may not extend to choosing a preschool. If presented with making a preschool selection, their concerns about nature-based education overshadow these memories and a more traditional environment is often their selection for a preschool experience. At the forefront of these concerns is that there is little causal or correlational research supporting children's readiness for school following their nature-based experience. Because an emphasis on literacy and math skills is not as evident in a nature-based program, family's question whether their children will be prepared for formal schooling (Hunter et al., 2019). The benefits of play and experiential learning for young children are well-documented (Kuo, Barnes, & Jordan, 2019), but the prospect of nature-based education as an alternative to traditional preschool programming continues to be met with skepticism from many U.S. families.

When families retrieve their children from traditional preschool programs and ask what they did that day, they are likely to see a picture they painted or hear about an experience on the playground or a song that they learned or listen to their child talk about what another child ate, said, or did. Some children in preschool programs take nature walks, watch seeds germinate, and pick up worms; all memories and experiences in the very brief life of a young child. These memories and experiences influence the adults they will become and were facilitated by the teachers in their classrooms who also have had their own significant life experiences that influenced the adults they became.

The Study of Significant Life Experiences

In 1980, research on significant life experiences was identified as a "new research area in environmental education" (Tanner, 1980). His research explored the relationship between the self-reported early experiences of active conservationists and their later interests. Tanner concluded that early experiences outdoors and in the environment

were dominant influences in respondent's later lives. During the decades that followed Tanner's work, research into the impact of significant life experiences has been replicated in a variety of settings resulting in the same findings; the source of later environmental attitudes and actions are influenced by early experiences with a positive role model and in time spent outdoors (Chawla, 2006). There is a caveat to this conclusion. The focus of significant life experience (SLE) research has typically concentrated on a participant sample of individuals who were self-identified environmentalists and environmental educators (Stevenson et al., 2014) leaving a gap in SLE research that provided a comparison group (i.e., participants either without a background in environmental activism or without an extensive history in outdoor activity). Critics of SLE research question whether the assertion that those who later in life become stewards of the environment were motivated to do so by early experiences or were simply using selective recall in retelling a SLE.

What are significant life experiences? Hacking, Cushing, and Barratt (2019) described significant life experiences as "important phenomenological events considered critical in determining or influencing concerns, beliefs, and actions in later life" (pg.2). The experiences might be single momentous events or regular experiences over time. Chawla (2006) noted that the strengths of research on SLEs were that it was qualitative when most environmental education research was quantitative, allowed for participants' own explanation of incidents, and provided a glimpse into the span of lifelong learning. The weaknesses of SLE research according to Chawla (2006), lie in issues of inconsistency and reliability. For example, while the initial prompt to a participant may be the same for all participants, the follow-up questions may differ depending on the response to the first question. Some find the inability to corroborate a participant's narrative concerning.

In one study using SLEs, Altan and Lane (2018) presented the following prompt to five female teachers from Turkey during an initial interview. "Imagine that your life has been a journey from birth until today. Talk about your life experiences at home, school, or as a learner during this life journey which had an impact on or contributed to your ways of thinking" (p.241). The researchers then explored which of the life experiences the teachers would identify as 'significant' and discussed with the teachers the relationship or contribution of their narratives and their dispositions. In the final interview, the researchers questioned the teachers on how their SLEs contributed to their teaching. The researchers reported that the participating teachers identified travel as a noteworthy experience and influenced their teaching practices by enhancing their communication style with children from all cultures.

Using narrative inquiry, Williams and Chawla (2016) interviewed 18 participants who had attended nature-based environmental programs between 4 and 40 years ago when they were 5 to 15-year-old children. The purpose of the study was to identify memories that were still important to the participants. The interviewers began by asking each participant the year they participated and any specific programs they remembered. This question was followed by open-ended questions asking the participants for more details and their experiences in the program(s). All participants recalled their time in the program to include many hands-on opportunities which ultimately led to a greater awareness of the natural world as adults.

Similarly, Liddicoat and Krasny (2014) explored the autobiographic episodic memories of 54 youth who had attended a residential environmental program five years prior. Using semi-structured interviews, their findings indicated that many participants remembered scientific information they had learned during the program and continued to use what they learned to understand their local environment.

To further investigate the influence of early nature-based activities, Asah et al. (2018) asked 23 entrants to a public city park whether they had participated in nature-based activities as a child. Although the participants were not necessarily avid environmentalists, they were choosing to spend time in a natural environment (i.e., city park). If the participant responded 'yes', the individual was then asked to "describe the pathways for this participation". Their life experiences were categorized into activities of self-exploration, exploring with other individuals, or explorations as part of a school, after-school, or organizational (e.g., Scouts) activity. Park goers who responded that they had not participated in nature-based activities as children were not further interviewed.

McClintic and Petty (2015) specifically targeted their study to the outdoor play memories of early childhood educators. They interviewed 10 early-childhood educators and the center director from a traditional preschool

program located in an urban area about their childhood memories of outdoor play. Although the respondents did not provide specific autobiographical memories, their responses were consistent and concluded that the teachers believed they learned the most when allowed to explore on their own and use their imaginations.

Using a phenomenological approach, Jorgenson (2013) interviewed three primary school teachers to investigate their acceptance and utilization of a school garden. The teachers were purposefully selected because of their use of the school garden. The teachers were interviewed twice; the first time to hear their life history regarding family, education, and the outdoors, and the intent of the second interview was to obtain their perspectives on teaching. Following coding, he concluded that the teachers drew their practices around the school garden from their environmental memories, their observations of children's behavior, and their beliefs about teaching and learning.

METHODOLOGY

The purposes in this study were to explore self-reported effects of significant life experiences of teachers from both nature-based programs and from traditional preschool programs in the U.S., and to investigate whether these self-reported experiences influenced teachers' actions and practices in the classroom. For example, one might expect that teachers who frequently camped or hiked as children would have established behaviors and teaching practices different than teachers who did not. To extrapolate even further, one might expect that these same teachers would instruct differently. If these expectations are true, then there are implications for differentiating professional development.

Research Questions

The specific research questions for this study parsed out the narratives of practicing nature-based educators (NBE) and traditional preschool teachers and asked:

- What significant life experiences do early childhood educators report as having contributed to their teaching practices?
- Do reported significant life experiences differ for educators in nature-based programs and those in traditional preschool programs?

Participants

A membership organization targeting early childhood nature-based educators was approached and assisted to solicit participants. Nineteen people responded to the recruitment solicitation from the nature-based organization. Ten of the 19 potential participants were interviewed. Two of the 19 respondents were not interviewed because they were recent graduates and had not yet secured a nature-based position. The remaining seven were contacted for an interview but subsequently did not proceed due to scheduling conflicts, personal commitments, or eventually the saturation point had been reached.

A national membership organization for early childhood educators was contacted to solicit traditional pre-K participants. Fourteen potential participants responded to the recruitment solicitation from the traditional early childhood membership organization. Ten of the fourteen potential participants were interviewed. Of the four potential participants not included in these analyses, one was a director of a preschool program and not directly working with children, one was teaching in China, one was a recent graduate, and one did not proceed due to personal commitments. The resulting sample comprised ten nature-based educators and ten traditional pre-K educators. Of the ten nature-based educators; eight were White females, one was a non-White female, and one was a White male. All of the traditional pre-K educators were White females.

The acronym NBE was used for participants from the nature-based sample and TRAD for participants from the traditional pre-K sample when referring to them collectively. When an individual participant is quoted, a pseudonym is used followed by the acronym NBE or TRAD to indicate their sample.

Education

The participants were asked their highest educational level, earlier degrees (if any), and areas of study. NBE participants and TRAD participants attained similar highest degrees. One participant held an associate's degree and one participant held a doctoral degree from each sample. Two NBE participants reported bachelors' degrees and six reported masters' degrees. Four TRAD participants reported bachelors' degrees and four reported master's degrees. TRAD participants' undergraduate degrees were in either early-childhood education, child development, or special education, with one exception. That participant held an English undergraduate major, followed by a masters' degree in urban education and a doctorate in educational leadership. In comparison, four of the NBE participants' undergraduate degrees were in either early childhood education, child development, or elementary education. The remaining six NBE participants reported undergraduate studies on public relations, environmental education, fashion, French, human resources management, or architecture. Four of the six reported having transitioned to early childhood education from career paths they did not find fulfilling. Natalie (NBE) said that she was "[initially] whole hog into the corporate world" but then referred to her ten years in human resources management as "a little soul-sucking. It was a position where I was doing a lot of firing and laying off and delivering severance packages and it was just crushing. It was horrible." Naomi (NBE) described her early career in fashion as "completely superficial and not really what I wanted to do." Although the educational levels for the samples were essentially equivalent, the career paths for the TRAD participants were more linear and consistent with their educational training than that of the NBE who for six of the ten was a career path that included a career change from a four-walled office setting to the outdoors.

Design

To address the research questions, self-reports of SLEs were collected from two purposely selected voluntary membership organizations of early childhood educators. The individual educators from each organization were a convenience sample of those who responded to the solicitation and were interviewed via Zoom. Their self-reports of experiences were then categorized into themes, and the themes compared across both groups of teachers.

Data Collection

All interviews were recorded and then transcribed through the Zoom transcription service, followed by a second reading to ensure accuracy of the transcription. Each interview lasted between 20 minutes to an hour and a half. Participants were sought who were currently teaching in a pre-K program and those who had been teaching at least two years. Because pre-K programs operated differently during the pandemic, the requirement for at least two years of experience was instituted to obtain reports of SLEs from participants who could describe their programs both prior to and since the pandemic. Potential participants were scheduled for an interview and asked the following questions:

1. Tell me about your career path. How did you get to the position you hold now?
2. How long have you been employed at (name of program) and what is your role?
3. Would you describe the program at (name of program)?
4. Tell me about your educational background. What was the emphasis during your training?
5. Are there any early experiences you can remember that inspired your career choice?
6. Did this experience influence your teaching practices? If so, how?

The interview questions were inspired by the research of McClintic and Petty (2015) and Jorgensen (2013) who both began their interviews of NBE educators by soliciting information on education and employment. To be inclusive of the teachers from traditional pre-K programs, the researcher defined teaching practices generally rather than limiting it to teaching practices in the outdoors. Throughout the interviews, participants were asked open-ended questions to give them the opportunity to clarify or expand on their initial response.

Data Analyses

After interviews were transcribed and participants checked their transcripts, a first-cycle coding method that Saldaña (2014) referred to as initial coding was used. The advantage of initial coding was that it prohibited any preconceived ideas of themes.

Transcribing the interviews and verifying the content of the interview was the major focus of the first step of organizing and preparing the data for analysis. This included contacting the participants again to ask them to member check their responses.

All participants' repeated statements, phrases, or images to generate descriptions and themes were coded. The sentiment of the statement or phrase was also coded. For example, some participants reported that they were discouraged by family members in pursuing a career in education which was coded as a negative sentiment. During the final step, the themes were summarized across participants from each group to compose a narrative of what these reports represented.

A random sample of data (25%) was coded a second time by an independent second researcher who is a current elementary public-school teacher with 20 years of experience in the classroom. A reliability score of less than 80% on the sample would have led to a thorough test of all data. The inter-coder agreement for coding the responses to the teachers' early experiences was 86%, and 85% for coding the influences on teaching practices. Response bias was controlled by member checking and a comparison of a sample of the audio files with the written transcript by an independent second researcher.

FINDINGS

Before determining whether the self-reported SLEs impacted the participants' teaching practices, the participants were asked to narrate the SLEs that inspired their career choice, and then were asked whether these experiences impacted their teaching practice (Research Question 1). This section summarizes the SLEs from the two groups of educators.

Significant Life Experiences

Twenty-six words and phrases were coded under four emergent themes. Table 1 shows the frequency of coded responses and instances of response by both groups. Because participants' responses could be coded under more than sub-theme, separate columns refer to frequency of each theme and number of participants whose responses were coded under that sub-theme.

Table 1
Coding for Theme: Significant Life Experiences

Sub-Theme	TRAD	*n*	NBE	*n*
Outdoor Experiences	0	0	48	8
Role Models	12	9	11	6
Books	3	3	0	0
Nature Compassion/Connection	0	0	3	1

Under the sub-theme of outdoor experiences, eight of the ten NBE participants reported 48 significant life experiences. Three of the ten NBE participants had fond memories of family camping trips. Nikki (NBE) shared that:

> *We camped every summer when I was a kid! I can very easily attribute my passion for the outdoors to my summer spent on the Cape in Truro, sleeping in a tent, rain or shine, eating breakfast under a canopy.*

Nessa (NBE) remembered her summers in West Virginia as a time when "we went around to different state parks and went camping. Camping with my family was definitely a formative experience. I loved it." Nellie (NBE), on the other hand, shared many early memories of outdoor experiences like biking and picnicking but said that her family never camped. "My father had been in World War II and had been in the Philippines and just had a really bad experience I think out in the jungles, and he just would never go camping, but we would go and have picnics."

Three of the ten NBE participants spoke of being a part of the Girl Scouts or another organized camp. Nadia (NBE) spoke of taking part in activities like "learning how to make fire and collecting sassafras for sassafras tea, collecting clay from stream banks and throwing that into pottery. We learned weaving and basket-making and whittling and panning for gold." Nikki (NBE) was less enthused about her scouting experience "finding it very boring" but acknowledging "Scouts have come a long way since I was a kid."

Although Nikki's (NBE) scouting experience did not meet her expectations, she spoke of the connection she had to nature from an early age. "My mom and I joke about me remembering when I first realized that paper came from trees. I was bringing home juice boxes because I couldn't bear to throw them away because the paper came from trees and I couldn't just throw away this thing from a tree. I wanted to find a way to give it back to the tree and I had this guilt about using this paper."

Under the sub-theme of outdoor experiences participants reported solitary activities such as "walking home from the bus and checking what slugs were under the rocks or whether there would be a salamander" (Nikki, NBE), and activities with other children and family members like "making haystacks and climbing anything that we could" (Natalie, NBE).

Under the sub-theme of experiences with role models, six of ten NBE participants shared experiences with role models. Nigel (NBE) shared stories of teachers who were memorable influences in his life. "Every once in a while, I would have a teacher that I kind of identified with, who I felt understood me." Others spoke of experiences with parents and grandparents. Natalie (NBE) spoke of her science teacher dad as "the guy who always corralled whatever kids were around to go look for snakes. Now I'm terrified of snakes but I so wanted to please him and have that experience with him that I was willing to do that."

Nine of the ten TRAD participants spoke of early experiences with role models such as family members and teachers. Tracy (TRAD) and Thea (TRAD) spoke of "loving their kindergarten teacher." Tori (TRAD) shared about growing up with parents who were in the theater and being "able to laugh and play and be present growing up out on the streets of New York City." Early experiences with books were reported by three TRAD participants; all three reported childhood books they still kept as treasures.

When asked whether these experiences impacted their teaching practices, all participants with one exception (a TRAD educator), emphatically stated that they did.

Differences in Teaching Practices

In this section are the findings from analyses of data in addressing the second research question, as follows: Do reported significant life experiences differ for educators in NBE programs and those in traditional pre-K programs? Table 2 shows frequency of coded responses and instances of response by both groups.

Table 2
Coding for Theme: SLE Influences on Teaching Practice

Sub-Theme	TRAD	*N*	NBE	*n*
Mirroring	2	2	22	8
Family Influence	0	0	11	6
Role Models	7	6	0	0
Intrinsic Motivation	6	4	16	5
Extrinsic Motivation	1	1	0	0
No influence	1	1	0	0

One of the sub-themes that emerged from the data was what this researcher called 'mirroring,' meaning replicating those play habits practiced as a child into their teaching practices now. Nessa (NBE) responded, "Oh yeah, absolutely. I think an important question for anybody who's working with kids outside is to think back about how you played as a child. The kids love small world play which is what I did a lot of as a child. I like edible plants so we did that this week and it's something that's super engaging to kids." Nellie (NBE) said, "I believe those experiences of just spending hours building dams on a creek were, yes, they impacted the way I teach because I get the value of that. I get that you're learning about water and you're learning about flow and you're learning about building, but the inner calm that it gives you as a human being to not be directed at everything you do."

A second sub-theme, family influence, also emerged from NBE participants' responses. Naomi (NBE) responded, "I think my whole upbringing influenced by teaching practices. We were a very 'I'm the parent, you're the child' kind of family. From that I always really wanted a respect for children to be given. I never really understood just because I was younger why my voice wouldn't matter. So, as an educator I really strive to make sure that the children are respected and that their voices are heard. I really think it's important for them to understand that they are valued as people even though they're children."

"My dad was one of those sort of a taskmaster but not. He didn't understand. How many times he said to me 'the shortest distance between two points is a straight line and you just zigzag.' When another teacher or adult or parent says something to a kid, I know exactly how that's being taken" (Nigel, NBE).

The influence of SLEs on the teaching practice of TRAD educators was not as apparent as it was with the NBE. A third sub-theme that was found was role models, especially teachers, who impacted the later teaching practices of TRAD teachers Teresa (TRAD), Tracy (TRAD), and Tammy (TRAD) spoke of remembering teachers who encouraged and inspired them.

A fourth sub-theme of intrinsic motivation emerged in data from TRAD participants. Tori (TRAD) responded, "Yes, influencing in terms of my ability to be aware and present with possibilities." Tracy (TRAD) spoke of "light-bulb moments when children learn something" and "sharing their joy." Thea (TRAD) spoke of her students as "brilliant creatures who primarily learn through play. I've witnessed it my entire life."

A fifth sub-theme, extrinsic motivation, emerged from the responses of Trisha (TRAD). Although Trisha (TRAD) talked of an experience as a child witnessing young children in a neglectful home benefitting from attending an early childhood education program, her own specific memory was that of realizing that early childhood education was an opportunity to "get a job just about anywhere."

Paradoxically, Trisha (TRAD) also responded that her "teaching practice wasn't influenced by her early experiences" which I coded as a sixth-sub-theme.

DISCUSSION

In the course of 20-minute to 90-minute interviews, there was an expectation that the significant life experiences would consist of stories of role models and family members, of travel and of books, of camping trips and spontaneous hikes. The participants' responses fulfilled that expectation and included some unexpected comments and responses. Participants addressed topics that were tangentially related to the questions that were asked. Because this discussion was not directly pertinent to the research questions, the participants comments, although informative, were not included in entirety. Some of their comments focused on compensation and on licensing. For example, many of the teachers repeated what Nessa (NBE) said, "I'm privileged enough to have a husband who is the primary earner, has benefits, and has been teaching for a long time. If I were a single parent, I couldn't afford to take this kind of job or if I were the primary breadwinner, it would be very hard."

Navigating the obstacles of obtaining program insurance, publicizing one's nature-based program without drawing too much attention from licensing and accreditation agencies, and operating within the constraints of state regulations were a challenge to the NBE teachers. A challenge that was met with innovative solutions. Naomi (NBE) contacted me after the interview to update me on her program. She indicated that she was unable to operate her nature school under any "proper regulations" and was exploring whether her program could be considered a church. Others like Nellie (NBE) operate nomadic programs with parents dropping their children off at different parks and wooded areas, pre-arranged in advance; never establishing a fixed space. Others refer to their programs as camps. Still others limited their operating hours and days of operation so as not to be considered a pre-K program. These revelations beg for additional research on licensing nature-based programs.

Differences in Career Paths

The goal with each interview was to establish an initial rapport so that participants felt comfortable responding. Starting each interview with a discussion on their career path or trajectory was a successful "icebreaker". A common response was "how long do you have?" before they would delve into their backgrounds. Overall, the responses to this question were the lengthiest but beneficial in terms of learning more about each participant. Some participants' mentioned the influence (or discouragement) of their parents and other family members when talking about their career paths. Others simply experienced the serendipity of a college part-time job as the catalyst for their career. Many of the NBE participants never realized that an early childhood nature-based educator was even an employment option.

When detailing the chronology of their career paths, their educational paths always entered the discussion. An unexpected finding in this study was the difference in the educational backgrounds of the NBE and TRAD educators. The TRAD teachers had a laser-focus from their undergraduate years toward a career in education, especially early-childhood education, motivated for some by their beloved kindergarten teachers and by the family members who, for some, discouraged them from a career in teaching. The NBE teachers often took a more circuitous route to nature-based early childhood education with more than one NBE teacher stating that they didn't know that a job existed that allowed them to combine their love for the outdoors with a passion to work with young children.

Difference in SLEs

The self-reports from the teachers interviewed indicated that the SLEs from NBE and from TRAD did differ. The SLEs mentioned by the NBE tended to involve outdoor activities sometimes solitary and sometimes with other people or groups such as the Scouts. The activity tended to be the focus of the story although sometimes a significant family member was involved. The SLEs mentioned by the TRAD tended to put a role model such as a family member in the center of the experience. The experiences were not necessarily outside and oftentimes did not involve an activity but simply a memory of the family member or role model.

A striking finding was the difference in the influence of these SLEs on their teaching practices. The NBE were prone to 'mirroring' the activities they did as children, sometimes activities they shared with family members, in their teaching practices. Several of the NBE referred to themselves as not being 'big adventure' people but more 'small

world' people preferring to create small villages with twigs, grasses, and bark, and most importantly to play as they did as children. Nessa (NBE) spoke of the "terrible" presentation she did early in her career in a first-grade classroom in North Carolina before realizing that she needed to 'mirror'. Her topic was Costa Rican rainforests; she had never been to Costa Rica. Neither she nor her students had any first-hand experience with rainforests.

In comparison, the TRAD were influenced by the practices of their early teachers and to a lesser degree by the influence of books. Their motivation for teaching was frequently altruistic and just knowing they wanted to work with children.

RECOMMENDATIONS

Nessa (NBE) said, "We have this fairy tale fear of the woods and that gets into the whole other element of risk and comfort level with risk, and how good this kind of play is for kids in terms of taking risks, of coming up against their fear and moving past it.:" Her reference to a fairy tale fear of the woods is a metaphor for the fear that some policy makers, stakeholders, and families hold about nature-based education. This section discusses recommendations for "moving past the fear".

Teacher Preparation

Nessa (NBE) said, "My mother sees what I'm doing now and she says, 'You would have loved that as a child.' True, I would and I still do so I still get to do it." Whether the NBE teachers who were interviewed would have pursued early childhood education undergraduate degrees with an emphasis on nature-based education if such a degree had been available then is an unasked question. The findings indicate that many found themselves initially pursuing a career they did not find fulfilling unaware that nature-based education could be a career which was not true of the traditional educators whom were interviewed. A recommendation from this study is that as teacher preparation programs discuss different philosophies and foundations of education to also include nature-based education as an option; an option that is becoming increasingly more common. Keeping in mind that not all pre-K programs are the same and not all are a good fit for all children, not all pre-K models are a good fit for all prospective teachers.

CONCLUSION

The significance of this study is its potential of adding information to the discussion, and most importantly, to influence educators who are not necessarily environmental educators to embrace their evolving roles. Davis (2007) wrote that the early childhood community has been slow to embrace the challenge of instructing children in sustainability. National organizations of early childhood professionals are just now beginning to grapple with the idea of explaining the importance of environmental stewardship to young children to some extent because those instructing the young children may not have a pre-disposition to this role. In 2020, the National Association for the Education of Young Children convened a voluntary group to discuss methods of incorporating sustainability into the ECE curriculum for teachers in both NBE and traditional pre-K environments.

As Louv (2005) wrote in his national bestseller *Last Child in the Woods* raising concern about the lack of time each succeeding generation of children spends outside resulting in what he referred to as nature-deficit disorder. Despite his warnings and parents' concern about too much screen time, this researcher's observations at numerous traditional pre-K programs would indicate children's accessibility to the outdoors and to nature is still very limited. The opportunity to play learning games on the computer is a far more popular activity for children than the dress-up area and certainly far more popular than the science center which frequently exists of a few rocks, some pinecones, and a few plastic zoo animals. Alarmingly, Ernst and Tornabene (2012) findings appear to validate a concern about future early childhood educators. They surveyed 110 early childhood education students from a U.S. university. Using a series of 16 photographs, the participants were asked to identify spaces most and least conducive to meeting educational outcomes. The structured environments were frequently selected as the most conducive while the natural, open environments were viewed as least conducive. Are early childhood educators adequately preparing children for the future? And, were they prepared themselves for teaching in the 21st century?

LIMITATIONS

Whether these research findings generalize to all nature-based educators or all traditional pre-K educators cannot be answered. That is the nature of qualitative research and a self-selected group of participants. The participants were all members of national early childhood organizations which may indicate a heightened commitment and passion for the field of early childhood education. Also, not known are the regulations and requirements imposed on them by their school's administration and by families of their students that potentially might influence their preferred teaching practices. None of the participants mentioned any restrictions but it remained a limitation nonetheless.

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CHILDREN'S BOOKS AND RESOURCES REVIEW

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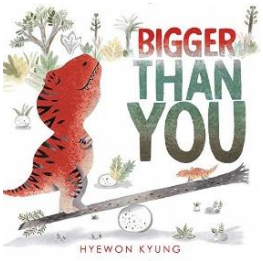
Book and Resource Review Editor

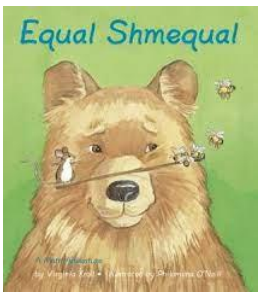
Math and Nature Connected Books and Resources

There are so many mathematical concepts to explore in nature, such as shapes, patterns, categorizing, numeracy, and one-to-one correspondence! Math is inherent in nature AND there are many ways to take mathematics outside. Children explore math through regular nature play as they play in mud kitchens, notice patterns, and find shapes in leaves. Below, find a list of math and nature related books and resources. As a caution, please verify the children's books will work for your setting, as many related books focus on more advanced concepts and ideas and some applications seem a little forced at times. I starred ones I particularly like. There is a lack of books focused on finding math in regular nature play—this is an area of opportunity for authors!



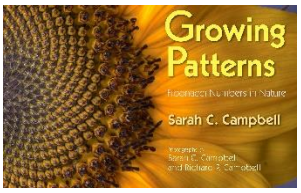
Bigger Than You by Hyewon Kyung

This comparison book shows dinosaurs engaged in nature play, creating their own seesaw with a tree and rock. Backmatter includes information on simple machines. It's a fun story and shows mathematical concepts and nature play without being overt about the principles.



Equal Shmequal by Virginia Kroll

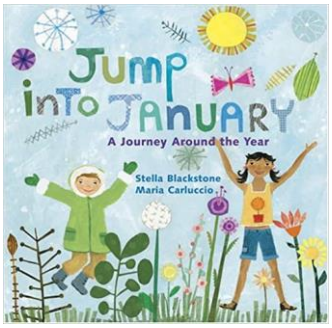
Animals watch children playing tug of war and then explore the concept of equal as they play tug of war. They divide their groups in many ways such as types of food the animals eat, whether they have fur or not, and size. They also try to balance a seesaw as they look at equal weights, with Bear and Mouse playing tug of war against the other animals. The book explores many ways to be equal, such as in math, art, law, and team sports!



Growing Patterns: Fibonacci Numbers in Nature by Sarah C. Campbell

The Fibonacci pattern of 1, 1, 2, 3 5, 8, 13 . . . is often found in nature! The beautiful natural pictures are organized for a visual representation of the sequence. The math includes pattens and simple addition. Pictures include

flowers, pinecones, pineapples, and the nautilus, as well as non-example spirals found in nature. Back matter includes more details around Fibonacci numbers and a glossary. Other books include *Mysterious Patterns: Finding Fractals in Nature*.

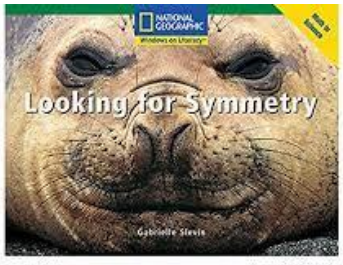


Jump into January: A Journey Around the Year by Stella Blackstone

This calendar book goes through the months of the year with time outside and a seek and find list for each month's picture, such as skating on the frozen pond in January, rain in April, gardening in May, the beach in August, and dancing leaves in November. Short rhymes accompany each two-page monthly spread. The illustrations are bright and cheery.

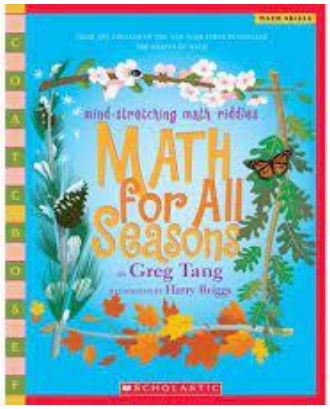
Just a Second by Steve Jenkins

This nonfiction book explores what happens in just one second, such as a flap of vulture wings, a black mamba slithering 24 feet, a bat makes 200 high pitched calls, a dragonfly flying 50 feet, and so much more! Backmatter includes a timeline of timekeeping.



Looking for Symmetry by Gabrielle Sleven

A book using natural elements to explore symmetry with children. Grab a mirror to explore the lines of symmetry and then take the mirrors outside for more symmetry exploration.

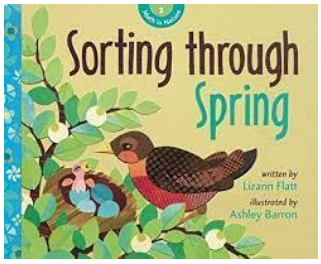


Math for All Seasons by Greg Tang

Intended for children aged 5-8, this problem-solving book encourages an open mind, thinking with strategy, using time saving methods, and simplifying problems. Rhyming phrases and coordinated illustrations ask the reader to solve age-appropriate math problems with a natural and holiday theme.

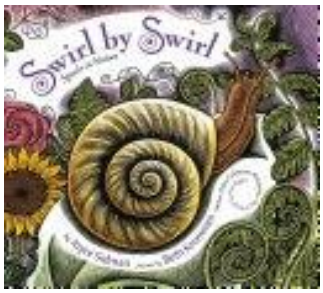
Pitter Pattern by Joyce Hesselberth

With a blend of fiction and nonfiction, the author helps children explore patterns in puddles, nature, soccer practice, and snacks. Backmatter includes ways to explore patterns in one list.

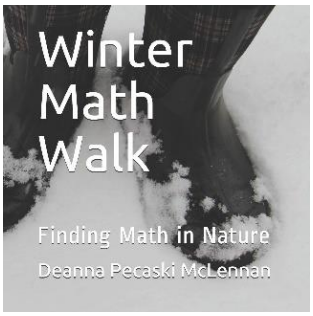


Sorting through Spring by Lizann Flatt

Questions rule in this book, asking the reader to make connections between nature and math. The interactive concepts include patterns, shapes, ratios, comparisons, graphing, and probability. The cut paper illustrations add to the patterns and mathematical opportunities. Some math concepts are more geared for K-2 students. The backmatter includes information on the many animals found throughout the book. Other books include **Counting on Fall* (Number Sense and Numeration), *Sizing up Winter* (Measurement), and **Shaping up Summer* (Geometry and Spatial Sense).



Swirl by Swirl: Spirals in Nature by Joyce Sidman
Simple poetry and beautiful illustrations of spirals in nature help readers understand spirals in the natural world around them. Backmatter shares different purposes and functions of spirals with examples and details of how spirals are found in nature. Board book available as well.



Winter Math Walk: Finding Math in Nature by Deanna Pecaski McLennan

Simple black and white winter pictures combine with general written observations of a walk during winter. Concepts explored include shapes, area and perimeter, size comparison, measurement, etc. The back matter includes an author's note sharing how to have a mathematical lens outside and how adults can support math investigations. Additionally, there is a page for each picture with the various math concepts, natural information, and scientific concepts. Other books by the author include *Playground Math*, *Puddle Math, Autumn Math Walk*, *Halloween Math*, *Summer Math Walk*, and *Spring Math Walk*.

Additional Resources

Early Math Counts (https://earlymathcounts.org/, College of Education, University of Illinois Chicago)
While not outdoor specific, there are free professional trainings around math for educators working with children ages 0-5. Many blogposts and other resources on the website include an outdoor focus.

Maths Play with Loose Parts (https://www.communityplaythings.co.uk/Learning-Library/Articles/Maths-play-with-loose-parts, article by Dorie Ranheim)
This blogpost explores loose parts and math in nature with a good list of activities, such as sorting, making patterns, shapes, etc.

Math Learning - and a Touch of Science - in the Outdoor World
(https://www.naeyc.org/resources/pubs/tyc/apr2017/math-learning-outdoors, by Deanna Pecaski McLennan)
In this NAEYC blogpost, Deanna Pecaski McLennan encourages taking math tools outdoors, noticing patterns, and exploring and sorting collections.

Math and Loose Parts in Nature **(**by Carla Gull, Loose Parts Nature Play)
In this blogpost and podcast episode, I explore concepts and ideas to recognize math in nature play, along with tips to enhance math, loose parts, and nature play.
Blogpost with pictures: http://insideoutsidemichiana.blogspot.com/2020/09/math-and-loose-parts-in-nature.html
Podcast episode on Loose Parts Nature Play: https://loosepartsnatureplay.libsyn.com/math-and-loose-parts-in-nature

Messy Maths by Juliet Robertson

Brilliant book on taking math outdoors with a variety of pictures, ideas, and resources. These low-cost approaches to mathematical concepts are easy to implement. Nature play and hands-on approaches are key with recognizing the math in everyday life. Juliet's blog is also a FANTASTIC resource with over 90 blogposts on math and the outdoors: https://creativestarlearning.co.uk/maths-outdoors/

Nature + Exploration = Boundless Mathematical Explorations (https://natureexplore.org/nature-exploration-boundless-mathematics-learning-2/ by Nature Explore)
This blogpost shares various stories of how math concepts have been explored in outdoor classrooms.

If you have ideas or would like to contribute book or resource reviews, please contact Dr. Gull at Carla.Gull@phoenix.edu.

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INTERNATIONAL JOURNAL OF EARLY CHILDHOOD ENVIRONMENTAL EDUCATION (IJECEE)
Addressing Issues, Policies, Practices, and Research That Matter

Information for Authors

The journal has two broad visions:

(a) To encourage thoughtful sharing of information about important ideas, conceptualizations, and frameworks, as well as effective practices and policies in early childhood environmental education; and

(b) To reach an extensive global readership in order to maximize the impact of the thoughtful information.

Thoughtful information may manifest through book reviews, description of educational approaches and programs, research investigations, and development or interpretation of theoretical perspectives. Associations among and between the following will be emphasized:

- Young children
- Family circumstances
- Community opportunities
- Policy mandates or recommendations
- Environmental activities, education, or experiences
- Mechanisms or processes related to knowledge acquisition
- Attachment or maintenance of affective dispositions
- Abilities, behaviors, or skills development related to good decision making in a range of environmental contexts; and
- Cognitive, economic, and social influences or impacts.

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