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# Toddler Play Preferences and the Teacher's Role in the Outdoor Play Environment

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## Abstract

Direct experience with nature is a primary component of environmental education and especially beneficial for young children. The present study examined the outdoor play preferences of toddlers and investigated the role teachers play in the outdoor space. Toddlers' outdoor play was video recorded by GoPro cameras and coded for preferred play locations and initiator of the play. Results showed that the three most preferred spaces for toddlers in the outdoor classroom were the sandbox, swing area, and play structures; least frequently visited were open areas close to the classrooms, the garden, and the tree area. In addition, toddlers initiated play 71% of the time whereas teachers initiated approximately 11% of the time and mostly in the swing area. Findings indicate that teachers may play a role in where toddlers prefer to play. Implications for teacher preparation regarding environmental education are discussed.

**Keywords:** outdoor play, early childhood, natural environments, toddlers, play affordances

## Introduction

Exposure to natural environments is valuable for young children (Chawla 2015). Direct experience with nature is a core concept of environmental education (NAAEE 2016) and

especially beneficial for young children who learn through hands-on experiences and sensory learning (Kostelnik et al. 2019). Early childhood education programs have invested time and money in building and maintaining quality early childhood outdoor environments (Dennis, Wells, and Bishop 2014). An emphasis on increasing children's contact with nature in recent years (Jimenez et al. 2021) has resulted in an increase in nature-based preschool programs available to families with young children (Dennis, Kiewra, and Wells 2019), which potentially benefit those many young children and their families who rely on early childhood education programs to provide early education and care. In the United States, almost 30% of children between the ages of 1 and 2 years old and over half (51%) of children 3–4 years old attend an early care program (Laughlin 2013).

Toddlerhood is a time of life characterized by curiosity, physical mobility, observation, and imitation of adults (Meltzoff 2007), assertions of independence, and rapid growth in vocabulary (Marotz and Allen 2016). Yet little is known about where young children in this stage of life prefer to play when presented with a variety of outdoor spaces. Examining how young children aged 18 months to 3 years old navigate outdoor spaces is important for educators who are tasked with teaching and engaging young children these areas. Further, understanding young children's engagement in outdoor play can inform pedagogical decisions and help teachers promote play in natural spaces which is beneficial to children's development.

### *Toddlers' outdoor play*

Exposure to nature has a wide range of benefits on children's academic performance (Coyle 2010), health and well-being (Chawla 2015; Louv 2008; Norwood et al. 2019), attitudes toward conservation (Chawla 2006), and even their social relationships (Ginsburg 2007). Natural outdoor spaces are known to support children's interests and needs, partly because of the availability of natural, open-ended materials that allow for imaginative play and investigation (Dennis, Kiewra, and Wells 2019). The outdoor space has natural occurring opportunities for valuable sensory experiences involving sights, sounds, scents, textures, and even tastes, making it an ideal environment for learning. For example, young children can feel, hear, smell, see, and taste rain, snow, and other elements. To capitalize on these opportunities, outdoor natural spaces have been constructed to support positive learning and developmental outcomes (Dennis, Wells, and Bishop 2014). However, few studies have focused specifically on toddlers' outdoor play at their early childhood center-based programs. One such study used behavior mapping and child tracking to investigate young children's responses to changes in their outdoor space, finding that children engage in a wider variety of activities in more natural spaces (Morrissey, Scott, and Wishart 2015). Dinkel and colleagues (2019) used video observation to examine physical and social unstructured outdoor play and assessed the physical and social play of young children. Results revealed that most children (56%) engaged in physical play described as active and that nearly all (91%) of the play was unprompted by adults. These results contribute to the understanding of children's use of the outdoor space; however, additional research is needed to help understand how staff promotes outdoor engagement and play.

### *Teachers' role in outdoor play*

Teachers' own attitude and values about outdoor learning can potentially influence their professional roles when working with children outdoors (Bilton 2020); however, the role of the teacher in the outdoor space is minimally explored in the literature. What does exist indicates that outdoor learning and play may require increased adult interaction to reap the full benefits of the outdoor space (Hunter et al. 2020). Free play and teacher-initiated activities are developmentally appropriate experiences for young children (Cutter-Mackenzie and Edwards 2013; Tranter and Malone 2004). A balance of each of type of experience may be necessary for nurturing children's enjoyment and knowledge of the outdoor space (Tranter and Malone 2004). Hunter and colleagues (2020) propose that the role of the teacher is paramount in shaping and fostering learning experiences outdoors. Further, they call for researchers to explore children's experiences in the outdoor space to better understand the activities they engage in and give them a voice.

### *Affordances of outdoor spaces*

This study conceptualized the opportunities present for young children in the outdoor space using Gibson's (1979) theory of affordances which suggests that individuals perceive the potential uses of an object or area based on their needs and goals. Individuals consider their purpose and then identify how the object or area can be complementary so that they can manipulate or engage with the object or area (Kernan 2010; Waters and Maynard 2010). Objects, surfaces, and substances are features of the environment that influence the potential affordances to the person or animal (Gibson 1979). The affordance of an object or environment centers on an individual's perceived uses or benefits to them and others. For example, tall, native grasses may afford teachers an aesthetic, natural boundary in which to conduct a story time. For children, the grasses may provide a secretive meeting place for pretend play. Environments have countless affordances that are dependent on the individual and their current task or need. In cases where the purpose is play, research indicates that children and their parents tend to select traditional playground settings for children's play over more natural, unmaintained spaces (Ernst 2018). Children and parents may view traditional playground environments as having more affordances for play than wild, natural spaces. Similarly, early childhood educators are more likely to select maintained outdoor spaces (e.g., parks, sheltered spaces, and areas with trails) as most conducive for teaching (Torquati and Ernst 2013). These findings suggest a preference for certain environments perceived to be beneficial for children's play and teacher's goals.

We conceptualized our research using affordance theory (Gibson 1979) because during outdoor free play time, children are able to pursue the objects and areas that they perceive as most beneficial to them. Similarly, adults may gravitate toward areas that they perceive as being most useful to their supervision and teaching goals. Further, affordance theory is a suitable lens for examining children's engagement in their environment as shown by its previous application in observational studies of young children in their environment (Little and Stapleton 2021; Morrissey, Scott, and Wishart 2015). The purpose of this study was to examine the outdoor play preferences of toddlers and investigate the role teachers play in the outdoor space. Specifically, there were two research questions:

**Question 1.** Where do toddlers prefer to play in the outdoor space?

**Hypothesis 1.** Based on previous findings (Dinkel et al. 2019) and understandings of children's development (Marotz and Allen 2016), it was predicted that young children would play in areas of the outdoor space that provide children opportunities for active, gross motor movement. Thus, we anticipated children would play in areas with climbing opportunities such as tree areas and man-made structures and on pathways that provide proprioceptive activities such as running, pulling wagons, and riding wheeled toys.

**Question 2.** Who (teacher or child) initiates interactions in the outdoor space?

**Hypothesis 2.** Considering recent findings (Dinkel et al. 2019), we hypothesized that children would initiate more often than teachers. However, given the program's emphasis on nature and the requirement that one teacher-led, structured activity be offered in the outdoor space, we predicted that the frequency of initiations between child and teacher would differ only slightly.

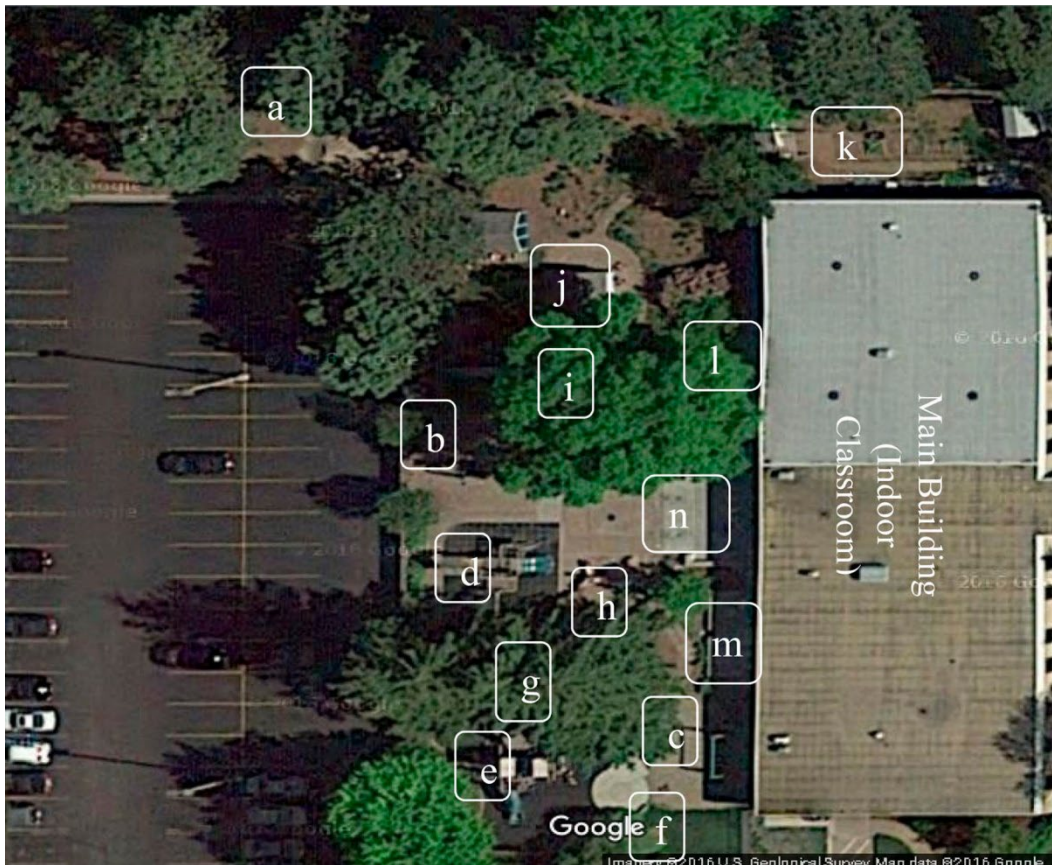
## **Method**

The study was part of action research, in which both authors were employed at the early childhood education program, responsible for pre-service teachers' professional training and engaged in identifying ways to improve educational practices in a nature-based program. This observational study examined the outdoor free play of toddlers (age 18 months–3 years) at a licensed and accredited early childhood education program located in a mid-sized city in the Midwest, U.S.A. This study was conducted in the summer months of May and June of 2016 and was approved by the university Institutional Review Board.

### ***Setting***

The early childhood education program was a full day, laboratory school setting located on a university campus. A core value of the program was to train preservice teachers earning their degrees in early childhood education. The program used an emergent curriculum approach with a strong emphasis on nature and outdoor learning. Preservice teachers attended a three-hour workshop for a national nature-based early childhood curriculum and received an activity guide with 21 lesson plans. Outdoor play sessions were consistent in the daily schedule except for during extreme weather (e.g., below zero temperatures, tornado warning, etc.). Children's interests and autonomy were important aspects of the program, and children had the option to voluntarily engage in one teacher-led activity during each outdoor play session. The program had a Nature Explore Certified (<https://certified.natureexplore.org/>) outdoor space that children and teachers accessed for at least two 1-hour periods, once in the morning and afternoon. Approximately 40 children ages 18 months–5 years old were enrolled at the program. Further, the program staff, children, and families frequently engaged in research as part of its overall mission.

The outdoor play space of the early childhood education program was identified as having 14 distinct areas, as shown in a birds-eye view in Figure 1.



**Figure 1.** Bird's-eye view of outdoor play space.

Each of the 14 areas were accessible during their free play outdoor time in every phase of data collection.

### ***Forest***

The forest (a) provides children with the most natural and wild space (see Figure 2). There are native flowers, pine trees, and a wooden platform that serves as a stage. Alongside the stage is an area with outdoor musical instruments. A mud kitchen area sits along the border and a nearby “mud mountain” which contains dirt and loose parts for children to scoop and use in the mud kitchen. The forest area contains loose parts such as tree cookies, fallen branches, pinecones and stones. Occasionally teachers will hang a hammock between two trees for children to read, rest, and swing in.



**Figure 2.** Views of forest area.

***Swing areas***

The outdoor space has two swing areas. One swing area for younger children (b) contains two small, high-back, full bucket swings (see Figure 3). A second swing area for older children provides children with two standard belt seats (see Figure 4). The ground under and around both areas is covered with small, rounded pebbles.



**Figure 3.** View of younger swing area.



**Figure 4.** View of older swing area.

***Play structure areas***

The outdoor space has two play structures with slides. Although they differ in size, children of all ages move freely in and out of the areas and make use of both. The play structure typically visited by younger children is smaller and nestled in a natural landscape with large pine trees providing a canopy. It is composed of a curly climber, rope bridge with wooden planks, climbing wall, small shelter, dual side-by-side slides, and monkey bars (see Figure 5). The play structure typically visited by older children is larger and includes built-in picnic tables, several stairs, a sliding pole, and a three-story clubhouse (see Figure 6).





**Figure 5.** View of smaller play structure.



**Figure 6.** View of larger play structure.

***Tree areas***

The outdoor space has many trees dispersed throughout the play area. Two specific tree areas were identified as part of this study. The first tree area is referred to as the “umbrella tree” and provides children with a private place for play (see Figure 7). It is low to the ground, so children can swing from the branches and climb in the tree. The second tree area is composed of mature pine trees with wooden plank paths winding around trees and throughout the shaded space (see Figure 8). These pathways are used for movement on riding toys and regular foot traffic. Children also leave the pathways to collect and investigate natural items such as pinecones.



**Figure 7.** View of umbrella tree.



**Figure 8.** View of pine tree pathway area.

***Water feature***

The water feature contains long pipelines curved to facilitate the flow of water. The pipelines connect colorful, rounded tubs and troughs of varying heights. The space includes an iron cast hand pump for pumping water (see Figure 9). The water feature area is a seasonal option that can be turned on only by a teacher. When in use, teachers add additional tools such as containers, scoops, and objects for exploring sinking and floating.



**Figure 9.** View of water feature area.

### ***Sandbox***

A large sand area takes up the most space in the outdoor area and is surrounded by sidewalk paths (see Figure 10). The sandbox provides children opportunities to construct, explore with their senses, dig trenches, and experiment with water flow when coupled with a garden hose. Nearby is a small, walk-in playhouse, where tools and toys are stored. The playhouse has open air windows that serve as a means for communicating with peers outside of the playhouse and for pretend play (see Figure 11).



**Figure 10.** View of the sandbox area.



**Figure 11.** View of the walk-in playhouse.

### ***Garden***

The garden area is designed for the display, cultivation, and enjoyment of plants. It has two planting areas that are defined by wooden beams (see Figure 12). A garden shed holds the necessary tools for gardening including, shovels, spades, and hand trowels. The garden is on the side of the building which provides the necessary sunlight for growing plants but limits the visibility of the area. For this reason, the garden shed is locked and accessible to children only under the supervision of a teacher.



**Figure 12.** View of the garden area.

### *Open areas*

There are three open areas for gathering in groups directly off the entrances. Two of the spaces serve as entrances to the playground for older and younger students (see Figures 13 and 14, respectively). The center of the building between the two classrooms also has an open space that is used for a variety of activities including sidewalk chalk and bubbles (see Figure 15). The open areas are made of poured cement and have wide, half-walls along the edges ideal for sitting and walking. Outdoor furniture is present in these spaces and includes wooden picnic tables with bench seats. Children and teachers use these spaces for a variety of activities including lining up, music and movement, group activities, and lunch.



**Figure 13.** Older open area.



**Figure 14.** Younger open area.



**Figure 15.** Center open area.

### ***Materials***

A GoPro camera was used to capture children's motion and behaviors. Children wore a GoPro HERO 3 camera on video mode with the lens facing outward on an adjustable, child-sized chest harness. The teacher pressed the start button from the moment that children stepped outside the classroom. The children kept the GoPro camera on for at least 30 minutes or until they were reluctant to wear it. Video data was uploaded and stored on a secure, cloud storage and management system. Using a GoPro camera resolved issues with previous observational research (Dinkel et al. 2019) and provided an unobstructed view of the child's movement and play without the presence of an observer. It also eliminated the need to follow the child around the playground. Children were introduced to the harness and camera ahead of time and witnessed peers wearing the camera. Initially, children were interested in the new item, but the novelty of the camera wore off and children resumed normal play.

### ***Participants***

Toddlers whose parents consented to their participation were randomly assigned to wear the GoPro camera during one regularly scheduled outdoor session, either the morning or afternoon session. After each child participated for one session, a second phase began in which each child wore the GoPro camera a second time. After the second phase, a third



phase begin in which each child wore the GoPro camera a third time and so on. Four phases of data were collected with each phase lasting six days. Data collection lasted for 24 weekdays. A total of 49 videos were initially collected from all 15 children. However, four children dropped out of the study over time due to fading enthusiasm and their preference to not wear the GoPro camera on hot days or at all. In the end, 44 videos from the remaining 11 children, aged 18–36 months old ( $M = 28.36$  months) were used for the current analyses. The sample was a majority white Caucasian children, which was representative of the school population (see Table 1).

**Table 1.** Participant demographics

Characteristic	Male		Female	
	<i>n</i>	%	<i>n</i>	%
<b>Age</b>				
18–24 months	1	9	2	18
25–30 months	1	9	2	18
31–36 months	1	9	4	36
<b>Race</b>				
American Indian/Alaskan Native	0	0	0	0
Asian American/Pacific Islander	0	0	3	27
Black/African American	0	0	0	0
White/Non-Hispanic/Non-Latinx	3	27	4	36
White/Hispanic/Latinx	0	0	1	9

### ***Data analysis***

The goals of this study were to identify where toddlers prefer to play in the outdoor space and who initiates interactions in these areas. To address both goals, the GoPro video recordings were coded in a manner consistent with previous studies (e.g., Kuh, Ponte, and Chau 2013) wherein up to 30 minutes of outdoor play was coded in 30 second intervals for location of play and the individual initiating.

Locations of play were coded deductively for each of the 11 children ( $n = 2,352$ ) using a priori codes established using the 14 defined areas of the playground. We calculated the proportion of visits to each location to understand children's movement in the outdoor space. Areas that share similar characteristics (e.g., younger and older swings, large and small play structures, pine tree and umbrella tree areas, younger and older open spaces, etc.) were aggregated for ease of comparison.

Initiation was coded into one of three categories: child, teacher, or not applicable. Initiations were defined as the start of an interaction and included behaviors such as drawing attention to something, asking a question, or providing an invitation to engage. The child initiation code was limited to the child wearing the GoPro camera. The child could initiate with any individual in the play space including teachers and children. When the child wearing the GoPro was identified as starting an interaction it was coded as child-initiated. When a teacher began such an interaction with the child wearing the GoPro, it was coded as teacher-initiated. Not all intervals included an initiation, in such cases the interval was coded as not applicable ( $n = 436$ ). The resulting 1,916 codable video segments were coded

as child-initiated or teacher-initiated. We calculated the proportion of each type of initiation at each location to determine the distribution of child and teacher initiations across locations.

To measure the reliability of our coding efforts, all three authors co-coded 25% of the videos. When at least two of the three codes were in agreement, the agreed upon code was accepted as the final code. When none of the codes were in agreement, the authors met to review the video, discuss, and come to consensus on the code. Because there were multiple categories for each variable and the data were rated by more than two raters, the intraclass correlation coefficient (ICC) was used to examine the consistency among raters (Hallgren 2012; McGraw and Wong 1996). The ICC was an average of .80 indicating a good reliability (Koo and Li 2016). The lead author then coded the remaining videos.

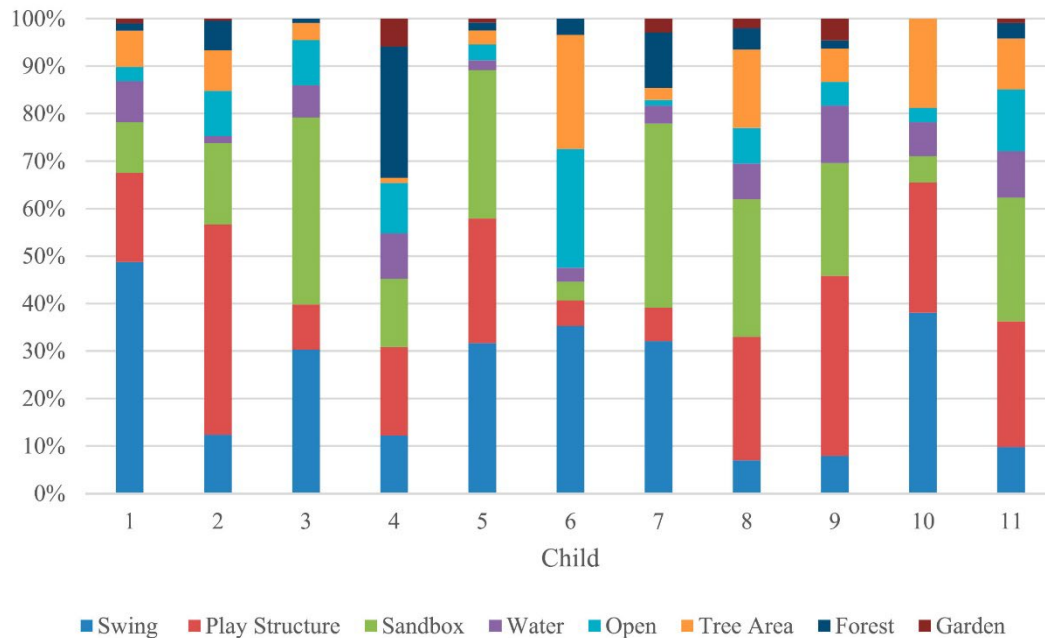
## Results

### *Toddler outdoor play preferences*

The first goal was to identify where toddlers preferred to play in the outdoor space as measured by the number of visits to each of the 14 areas. The three areas most frequently visited by toddlers were the sandbox, younger swings, and the play structures (see Table 2). The areas least frequented by the toddlers were the older and younger open areas, the garden, and the umbrella tree. Areas of the play environment that included the most nature (i.e., forest, tree areas, and garden area) composed only 16.4% of toddlers' visits, whereas areas with manmade features (i.e., swings, play structures, and playhouse) composed nearly half (46.7%) of the visits.

Location	Visits	
	<i>n</i>	%
Swing	566	24.1
Younger	371	15.8
Older	195	8.3
Play structures	531	22.6
Smaller	252	10.7
Larger	279	11.9
Sand area	529	22.5
Sandbox	413	17.6
Walk-in playhouse	116	4.9
Water feature	152	6.5
Open areas	190	8.1
Younger	57	2.4
Older	6	.3
Center	127	5.4
Tree areas	215	9.1
Umbrella tree	89	3.8
Pine tree pathway	126	5.4
Forest	129	5.5
Garden	40	1.7

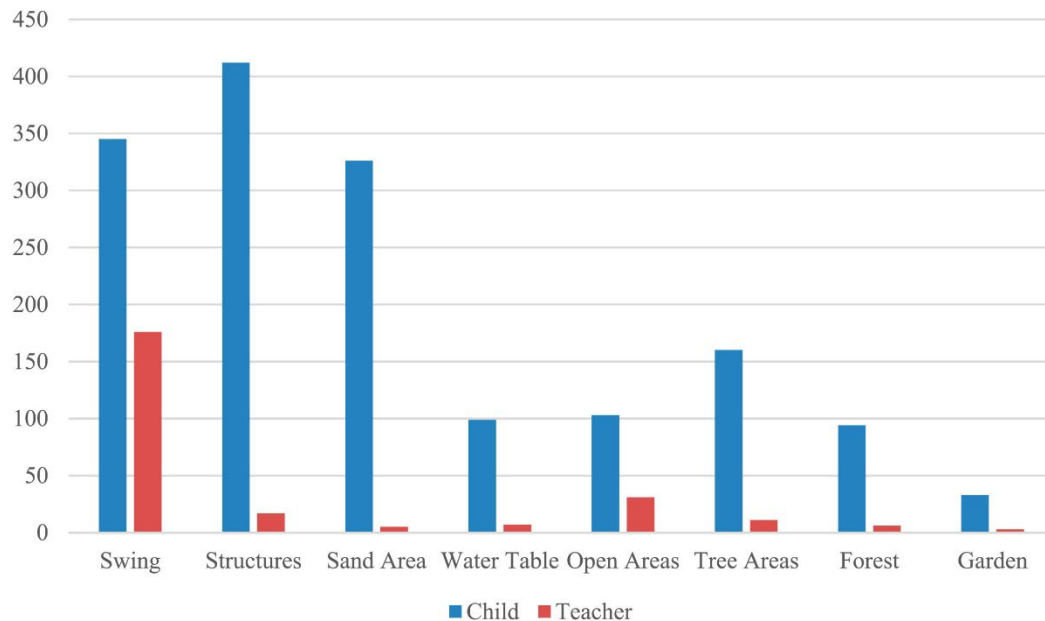
Data was analyzed by individual child to better understand how visits to each area were distributed among children (see Figure 16). As described earlier, similar locations with multiple subareas (e.g., swing areas, play structures, tree areas, sand area, and open areas) were combined. Results show that although there are individual differences in preferences between children, the most popular areas were visited by all children at some point during the study (e.g., swing, play structure, sandbox, and water). Conversely, not all of the children visited the forest and garden areas.



**Figure 16.** Percentage of visits by location and child.

### *Child and teacher initiations in the outdoor space*

The second goal of this study was to identify who initiated interactions in the outdoor areas. We used descriptive statistics to identify the proportion of initiations ( $n = 2352$ ) made by teachers and children. Results indicate that teachers initiated approximately 11% of the time ( $n = 256$ ), children initiated 71% of the time ( $n = 1660$ ), and about 19% of the time ( $n = 436$ ) an initiation did not occur during the coding interval. Children initiated interactions the most in the sandbox, swings, and play structure areas (see Figure 17). Similarly, teachers initiated the most interactions in the swing areas. However, teachers did not initiate at all in the older children's open area and the walk-in playhouse located near the sandbox area. Areas where teachers initiated only a few times were the umbrella tree, younger children's open area, and the garden.



**Figure 17.** Initiations by children and teachers in each area of the outdoor space.

Toddlers initiated more in areas they visited most often: swings, structures, and the sand area. Teachers initiated the most when near swings, an area in which children depend on teachers for getting in and out of bucket-style swings and for pushing. Teacher initiations occurred next most frequently in the open areas nearest the building. As described earlier, open areas were primarily used for structured, teacher-led activities and a gathering place during transitions in and out of the building.

## Discussion

### *Children prefer familiar areas*

Results of this study indicate that children prefer the swing, play structures, and sand areas of the outdoor space based on the frequency they visited and played in those areas. There are at least two explanations for these findings. First, the areas toddlers deemed as preferred play areas are common to most outdoor play areas that children would encounter, and, thus, they may have prior experiences with such places. Young children do not have as much time in nature as in previous generations (Burriss and Burriss 2011; Juster, Ono, and Stafford 2004) which may influence the types of outdoor areas children experience. Children's time in nature is influenced by their parents (Holloway and Valentine 2000), and research shows parents prefer more traditional playground settings (Ernst 2018). Children's familiarity with traditional playground settings may help them recognize the affordances in the space and make them more likely to visit. Conversely, areas that children did not visit frequently included more natural spaces such as the tree areas, forest, and garden. The lack of toddler visits to those areas needs further investigation and underscores the

need for teachers to facilitate engagement in those areas, as children may be unlikely to visit them independently. Toddlers' experiences in nature are key because the early years are known to be especially important to developing environmental literacy, and nature-based programs are known to provide engaging and worthwhile experiences (Ardoin and Bowers 2020).

*Developmental factors may influence where children play*

The second explanation for why toddlers visited swings, play structures, and sand areas the most is that toddlers are known to engage in active movement during their unstructured outdoor play (Dinkel et al. 2019). Toddlers' developmental growth patterns indicate that they are acquiring basic gross motor skills (Marotz and Allen 2016); thus, the affordances of fixed playground equipment may provide them with opportunities to practice and refine these skills. Previous research on toddlers' play in the outdoors indicates that when swings are available, they are used frequently (Dinkel et al. 2019). One study of preschoolers revealed that for both children with autism and typically developing children, the sensory experience of movement via swinging was a favored experience (Dickie et al. 2009). Young children, particularly toddlers, may be meeting their proprioceptive and sensory needs through the use of swings and climbing. For example, a toddler who is swinging can gain visual stimulus as the scenery around them moves and tactile input from the swing itself. The act of climbing into a swing can provide practice at hand-eye coordination, balance, and climbing, all skills that toddlers are developing (Marotz and Allen 2016). In regard to play and social activity, toddlers are known to be naturally curious and explore everything in their environment. They like to be around other children but may not always play with them, preferring to observe and imitate other children's actions instead (Marotz and Allen 2016). Swings and the sand area may have provided an opportunity to view and observe others while also meeting sensory needs. The play structures in this study may have provided opportunities to practice developing motor skills for toddlers. In summary, toddlers may select an area to play in given the potential affordances it provides based on their development.

*Teachers initiate the most in toddlers' preferred spaces*

Results of this study showed that toddlers initiated most interactions in the outdoor space, which supports previous research by Dinkel and colleagues (2019) that found that children initiated play activities over 90% of the time during unstructured outdoor play. This result may be explained by programmatic factors because the philosophy of the programs emphasized that children explore and lead play while teachers facilitate or guide. Thus, our hypothesis was supported and not surprising that children were the primary initiators. Another finding was that teachers' initiation with children occurred mostly in the swing area. To some degree, this involvement and initiation is also expected because of the assistance children required to use the bucket swings (i.e., being lifted into and out of the swing); however, the lack of initiation in other areas may indicate missed opportunities for initiating engagement with children, particularly in natural spaces. Given that young children may have limited prior knowledge and experiences with nature (Burriss and Burriss 2011), they may be less familiar with the affordances that nature spaces offer for meeting

their needs. Teachers may be important for bridging that gap and helping children experience the affordances of the natural environment (Hunter et al. 2020).

### *The role of teaching experience and training in outdoor engagement*

Teachers may play an important role in extracting the potential of natural affordances for children (Morrissey, Scott, and Wishart 2015); thus, they may benefit from training and education to capitalize on the affordances of the outdoor space with young children (Hunter et al. 2020). However, our results indicate that trainings alone may be insufficient. Preservice teachers in the current study not only participated in a workshop training experience but also received supporting materials (e.g., lesson plans for outdoor activities) and supervision from experienced faculty and high-quality outdoor facilities at the program. These resources addressed what in-service teachers in previous studies reported as barriers, such as lack of training experience in environmental education and a lack of support from administrators (Shume and Blatt 2019; Rojo-Ramos et al. 2021). However, despite these supports for teachers in the study, their initiations in the outdoor space were still low.

There are several reasons for this result. First, the opportunity for preservice teachers in this study to act as the lead classroom teacher was short. Secondly, when preservice teachers were not the lead classroom teacher, they positioned themselves as assistants by offering a supportive role not only to their co-teaching peers but also potentially to children (e.g., pushing swings, turning on water feature). Third, preservice teachers, by definition, are emerging teachers and are still acquiring skills, content knowledge, and effective teaching strategies and thus may lack experience to proficiently implement the nature curriculum in a play-based way with children. As Torquati (2010) noted, teacher's disposition and behavior might influence children's dispositions and behaviors. For example, curious, engaged children had curious, engaged teachers, and thus, teachers who love to embrace nature may impart this to children who then love to embrace nature.

### **Implications**

The findings from this study have implications for practice. Teachers should intentionally invite children to explore areas they are less familiar with, such as natural spaces. Toddlers enjoy being near familiar adults and may use them as a base for exploration. Teachers can fulfill this role by visiting less familiar, natural spaces with toddlers to provide them with a sense of security. By providing more frequent opportunities to explore a natural area of the outdoor space, children may become more familiar with the affordances it offers. As mentioned earlier, toddlers may be selecting spaces that provide them the chance to develop their gross motor skills and satisfy their sensory needs. Natural spaces can also provide such opportunities for toddlers, however, toddlers limited experiences with nature may be restricting their use of such areas. Frequent visits to the natural spaces with a trusted adult or teacher are recommended as a way increase toddlers' familiarity with the affordances of nature.

Finally, this study found that teachers initiated most in areas where their role was more easily defined and clear, such as assisting children on swings. To expand teachers' initiation in natural spaces, they may require further education. Thus, a training program for

nature education should not only prepare teachers for content knowledge regarding nature and effective strategies of implementation of outdoor activities (Torquati and Ernst 2013) but should also help teachers connect nature education to other areas of early childhood education, such as child development, theories of play, and supportive strategies. Moreover, programs should evaluate the goals of the outdoor space to ensure they are properly preparing teachers to meet those goals. The exchange of ideas between teachers may also be beneficial for understanding other approaches and identifying opportunities for teaching in the outdoor space (Rojo-Ramos et al. 2021). Ideally, both teachers and children are encouraged to be involved in the design of outdoor learning spaces, so that children's preferences and needs can be met, and teachers can gain an understanding about why and how the outdoor spaces are designed in certain ways (Almers et al. 2021).

### **Limitations and future research**

Although the use of the GoPro was beneficial for removing the outside observer, which can be distracting to children, the GoPro camera provides only the view as seen from the perspective of a single child and thus may lack contextual information about what is happening around them outside of the view of the lens. In addition, the study was conducted at only one program with a small sample size. Although it provided an in-depth case for the understanding of toddlers' outdoor play preferences and teachers' role in outdoor environments, the results cannot be further generalized. Future research is encouraged to extend the study by involving multiple childcare programs with a larger sample size, as well as examining whether teachers' teaching experience and professional training on nature education play a role in initiations of outdoor activities.

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