

Affordances of Orchard and Forest as Playscape for Young Children in Malaysia

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ABSTRACT

In Europe and North America, there is a plethora of studies on importance of outdoor environment on children's functioning. Young children perceive outdoor environment such as forest, camp ground and park as playscape offering a variety of functional properties called affordances. This study presents empirical findings on a phenomenological inquiry on young children's behavioral responses experiencing orchard and forest in Perak, Malaysia. Through a participatory investigation on 18 middle childhood boys, the authors documented sensorial and motoric actions of the children using note taking and tape recording. The behavioral data were analyzed in two ways: levels of affordances and taxonomy of affordances. The two-day experience revealed 65 affordances which was dominated by utilized affordances (n=38), followed by perceived affordances (n=23), and lastly, shaped affordances (n=4). The result suggests the children were active in performatory and exploratory activities such as hiking on trail, picking fallen durian fruits, plucking leaves, climbing slippery slopes, holding treelets and rattan climbers to climb slopes, ducking under fallen log, picking pebbles from stream bed, throwing pebbles on water surface, and many more. These motoric activities were associated or generated by perceiving the orchard and forest features including scanning trails and forest floor, hearing sound of birds and cicadas, observing water cascade and water striders, avoiding touching spiny rattans, and more. Finally, in the taxonomy of affordances, most of the children's performances were with vegetations, examples were observing durian fruits on tree branches, searching fallen fruits, grasping fruit stalks, picking attractive yellow pods, breaking pods with fingers, and seeing marble-like seeds in the pods. The study suggests that orchard and forest were playscape for young children to perform, explore and manipulate natural elements.

Keywords: Young Children, Affordances, Forest and Orchard Environment, Functioning

1.0. INTRODUCTION

There is a plethora of theories and empirical studies suggest that children contact with the natural environment is crucial to their physical, social and cognitive development (Sebba, 1991; Faber Taylor et al., 1998, Chawla and Heft, 2002; Khan, 2002; Kellert, 2002; Louv, 2006). The natural environment provides children space to play (Fjortoft, 2004), to interact with each other (Kytta, 2003), to set boundaries and to feel sense of control (Olds, 1989), and to understand the outer world (Faber Taylor et al., 1998; Sebba, 1991). Hammitt (2000), Sobel (1999; 2002), Rivkin (2000) and Gleeson and Sipe (2006) note that experiencing the forest affords people to get away from everyday places and to get privacy. The natural experience permits fascination because the forest as natural setting is compatible with what one wants such as hiking, sightseeing and climbing. Fascination is derived from the natural places because people get peace and quiet, tranquility, and moments of privacy (Hammitt, 2000).

Outdoor physical experience allows active living, dexterity and mobility through participating in recreational activities. An empirical study by Fjortoft (2004) found that playing in a natural environment such as forest improved motor abilities and development of middle childhood children. Much of the play activities are functional play such as climbing rocks and trees, running and tumbling and sliding slopes. Moreover, outdoor experiences in forest by Norwegian kindergarten children allow them to develop positive attitudes to the wilderness (Borge et al., 2003). Studies on children in outdoor environment suggest children attract to outdoor features not on their forms or shapes but on the functions of the

features (Fjortoft, 2004; Heft, 1988). Function is the interaction of the children with the spatial elements in the ecosystem (Forman and Godron, 1986). Heft (1999) explains how children perceive the functions of the environment and utilize them for play: If a tree is climbable it affords climbing; if a stone fits the hand it is grasp-able or throw-able and thus affords grasping and throwing. In other words, the functional meanings of the elements trigger children to interact with them. Inasmuch, Ismail (2008) found that middle childhood children perceive boulders at river as climbable features that afford scaling, sitting, looking-out from and hiding. It means that natural environment such as forest can afford a variety of physical activities for children to involve in gross motor skills (Fjortoft, 2004). As such, children prefer to play to nearest wild places such as woodland (Pyle, 2002). Playing in nature means children get freedom to explore and interact with the natural element with little or no restriction or supervision. Interaction with the natural world is direct and spontaneous (Chawla, 1994; Kellert, 2002).

Direct experience with natural environment such as forest permits children to conduct three functioning: cognitive, physical and social (Hart, 1999; Khan and Kellert, 2002; Moore and Young, 1978). The cognitive, physical and social experiences generates six developments: (1) increases self-esteem and confidences, (2) improves an individual's ability to work co-operatively, and increases children awareness of others, (3) increases motivation and concentration, (iv) contributes to the development of language and communication skills, (v) improves physical motor skills, and (vi) contributes to an individual's knowledge and understanding of the environment (O'Brien and Murray, 2007).

2.0. MEANING OF AFFORDANCES IN CHILDREN-ENVIRONMENT RELATIONSHIP

J.J. Gibson's Theory of Affordances has been used to examine the relationship between functional properties of the environment and how environments are used (Clark and Uzzell, 2002). "The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1979 pp.127). According to Kytta (2003) affordances are the "functionally significant properties of the environment that are perceived through active detection of information" (p.45). That the properties are recognized when the children encounter, traverse, construct and perceive places (Christensen, 2003). Kytta (2003) further posits that affordances include properties from both the environment and the acting individual. As such the affordances are always unique and different for each individual and each specific group of people (Kytta, 2002).

Affordance of an environment is defined by the individual's qualities, such as children's physical skills or bodily proportions (Kytta, 2003). As such, Heft (1999) posits an object that smaller than the hand-span of a child, for example, a twig, is perceived by the child to be graspable, which is it affords grasping. The twig also affords the child to throw it away, to scratch the ground, to dig dirt, and so on. Thus the twig, as an environmental feature, has multiple functional significances understood by the child through experiencing the environment. Therefore, the concept of affordance is well suited for describing the psychologically essential qualities of children's environment (Kytta, 2002). It seems that children take particular delight and continue to engage those affordances that give clear evidence of their efforts.

According to Heft (1999), the affordances of natural environment for children activities can be categorized into a taxonomy consisting of 10 categories of environmental quality: flat, relatively smooth surfaces, relatively rough slopes, greenery and wildlife, graspable /detached objects, attached objects, non-rigid attached objects, climbable features, aperture, microclimate, moldable material, and water. A study on children's outdoor environments by Kytta (2002) improves the taxonomy by adding category affordances for sociality and play, and subtracting category of aperture. In this study, which concerns on affordances of streams and rivers for children functioning, extends the taxonomy with environmental affordances that support vegetation and wildlife. The taxonomy tells what categories afforded the most or fewest functional properties to the children during their play and social activities.

In the view of children's perception and movement, Kytta (2003) further categorized the affordances three levels: perceived, utilized and shaped. Perceived affordance is the functional property of a feature viewed by a child and offering him for an activity. For example, an overarching tree over a stream possesses the property for a child to jump from it into the water. Utilized affordance is the property of a feature being used by a child in an activity. When a child dives into deep water, for example, his is acting on a utilized property of the water for a play activity. Shaped affordance is the property of the feature being changed by the activity of a child, for example, moulding a mound from sand.

3.0. AIMS AND OBJECTIVES OF THE STUDY

This research explores on the functioning of children with the elements of forest and orchard. It examines the physical, cognitive and social interactions of middle childhood children experiencing the settings. The objectives of the

research were: (1) to study children's functioning and process of participation in forest and orchard towards learning and knowledge development in outdoor environment; and (2) to investigate environmental knowledge and awareness of middle childhood children on the two settings.

4.0. DEFINITION OF CONCEPTS

Forest is a natural and dense jungle located far from a rural community which is composed of a variety of tall tropical trees and undergrowth (Figure 1). The forest is a place for the locals to gather wild fruits, firewood, rattan and medicinal produces. *Orchard* is defined as a cultivated fruit farms composed of tropical fruit trees and generally located in or near to rural settlement (Figure 2). *Play activities* are classified according to into categories of functional play, construction play and symbol play (Frost, 1992). These are play forms that enhance physical activity and gross motor movements (Fjortoft, 2004). *Playscape* is defined by Frost (1992) as a landscape that affords children to ability to play. *Performances* are defined by Chawla and Heft (2002) as children's functioning which are categorized into performatory, exploratory and productive activities (p. 206). "Performatory activities are those actions directed toward some objects or other individual. The individual is making use of already known properties of environmental features that are available. Exploratory activities are actions directed toward discovering new properties. The individual is seeking to uncover new functional properties that may be latent in the surroundings. Productive activities ate those actions transform the environment features, and having particular functional properties being created" (Chawla and Heft, 2002 p.206). In a forest park, for example, a performatory activity is picking acorns from the ground, and an exploratory activity is searching for edible fruits such *Lansium aqueum* (Langsat) and *Baccaurea bracteata* (Tampoi), and a productive activity is cutting treelet stems and tying them using a string to make a pole to harvest the fruits. Inasmuch, the productive activity is a manipulative action affording children to shape a product. *Affordances* are the functional meanings of a feature which are perceived through action, and the perception of individual affordances is part of the whole of activity (Gibson, 1979). An affordance is the property of an object in relation to the perception and activity of an individual (Kyttä, 2002, 2003).

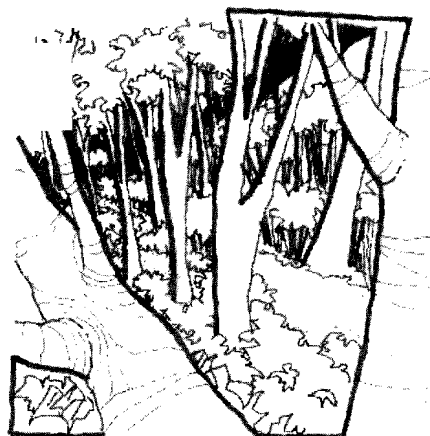


Figure 1: Tropical forest is naturally dense with trees, shrubs and undergrowth



Figure 2: Orchard is a farm planted with fruit trees and it is located near to settlement

5.0. STUDY DESIGN AND ANALYSIS

The study was carried out with middle childhood children from an orphanage in Perak, Malaysia, using a phenomenological approach. The orphanage was located in a small town, Chemor, 80 kilometers from the study site. Eighteen boys, aged 5 to 12, were brought to the site by the caregivers of the orphanage. They stayed for two days in timber chalets of a camp located in an orchard. Each chalet sheltered four children and it was situated along a hill stream. In other words, the children were staying in a forest-

like environment shaded by fruit trees and riparian tree species.

The site was a virgin forest and a composite of orchards located on a hilly landform in Kampong Cheh, Perak, approximately 550 meters above sea level. The orchards were composed of matured fruit trees including durian, rambutan, garcinias and parkia planted by villagers of Kampong Cheh. Some of the trees reaching 40 meters high with large boles and wide buttresses. In general, the undergrowth of the forest was dense causing some difficulties for the children to traverse along existing trails. Hence, depth of visibility was short. In contrast, the undergrowth of the orchard was thin and low allowing the children to view far distance. Moreover, the gradients of landform in the orchard were less steep than the forest.

The journey into forest and orchard began walking on trails from the chalet area located in an orchard and walked into several orchards and ending in the forest. The children were guided by a villager from Kampong Cheh. The guide made random stops at point of interest including footbridge crossing a fast stream, a cluster of durian trees bearing young fruits, a tall and high buttress tree, on a hilltop overlooking the orchards, on steep slope for resting and at a stream for rest and swimming. Both researchers participated in the two days outdoor experience recording the sensorial, motoric and social activities of the children in tape recorder, photography, and field journals. The sensorial activities were word and phrases mentioned by the children during conversation with peers, guide and researchers. These were their perceptual responses suggesting their preference or dislike on elements or conditions of the settings and their scanning behavior to maneuver themselves along the trails. Motoric activities were physical actions of the children such as walking, hiking, climbing and sliding on steep slopes. And, social activities were interaction or transaction with each other including taking, holding hands to climb slope or tree, sharing drinks or food, splashing water to others and searching shrimps in stream and search pebbles from stream bed. At each stop, the researchers causally interviewed the children while sharing drinks and food with them. In other words, data of the children performances was elicited by participatory mode.

The data of children's activities were considered as phenomena and were interpreted using Denzin (2001) interpretative process. The first step of the process was bracketing the children's behavioral responses into two categories, at orchard and at forest. At the orchard, the responses were further categorized into three types: (1) activities at stream, (2) hiking in orchard, and (3) resting on hilltop. In the forest, there was only one category, which is, hiking and resting. The responses were considered as

affordances which were later bracketed into two categories: (1) levels of affordances, and (2) taxonomy of affordances (Heft, 1999; Kytta, 2003). The second step of the process is explanation on the levels of affordances and taxonomy of affordances put back the children's phenomena into their functioning (performances) and their knowledge on the outdoor environments. Accordingly, it means that the research is contextualizing the phenomena into the children physical and social worlds (Denzin, 2001).

6.0. RESULTS AND DISCUSSIONS

6.1. Levels of affordances

The performances of the children were categorized in three levels of affordances: utilized (n=38), perceived (n=23) and shaped (n=4)—see Figure 3. It means that the children were active in performing motoric activities such as hiking on trail, picking fallen durian fruits, plucking leaves, climbing slippery slopes, holding treelets and rattan climbers to climb slopes, ducking under fallen log, picking pebbles from stream bed, throwing pebbles on water surface, and throwing stones to tree trunk, and many more. Inasmuch, the utilized affordances were associated with perceived ones such as feeling cold while swimming in the stream, seeing bulbuls and magpie robins while swimming in the stream, watching peers searching for shrimps in the stream, and scanning and avoiding thorny rattan while climbing down the slopes. The results suggest that the forest and orchard afforded a variety of functional properties to engage their attention (Kytta, 2003) and to permit physical movement and competency (Kellert, 2002). Notwithstanding, the children only managed to manipulate three properties on the elements found in the forest and orchard: making camp fire from fallen branches and logs, making clothline from a bamboo pole to dry their clothes, and making a fishing rod by cutting a small branch from a tree. Low amount of shaped affordances means the children perceive low opportunity to practice hands-on experience with the elements of the forest and orchard. Possibly, this was due to the short span of time the children experience in the outdoor settings.

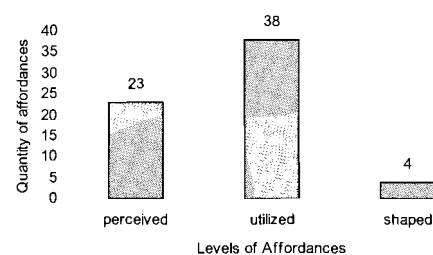


Figure 3: Levels of affordances in the forest and orchard settings

6.2. Taxonomy of affordances

Figure 4 shows the taxonomy of affordances the forest and orchard offered to the middle childhood children. As can be seen, vegetation provided the highest number of affordances (n=13). Examples of activities with the vegetation were picking young durian fruits, plucking young garcinia leaves, hurdling over fallen logs, holding treelets to climb slippery slope, and touching moss with feet and hands. The result suggests that the forest and orchard possessed a variety of elements for the children to play. Not only the children recognized the parts of the vegetation, they also able to identified the difference branching character of the trees. Sixty per cent of them recognized the monopodial tree over the sympodial ones. We speculate that they were familiar with the sympodial trees found in their home garden and thus able to differentiate the unfamiliar and uncommon one, the monopodial type (Figure 5). This perception is somewhat consistent with the idea of Summit and Sommer (1999) that vertical slender trunks attract children's visual response.

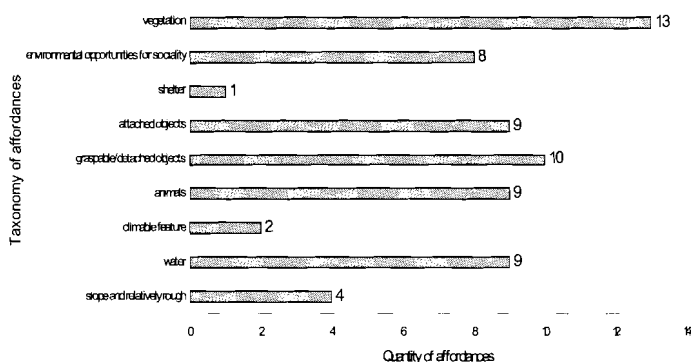


Figure 4: Taxonomy of affordances of children experience in forest and orchard setting

The second highest of affordances was offered by graspable or detached objects (n=10) such as pebbles, fruit stalks, sand and dried leaves. At the chalet site, the elements of the orchard afforded the children watching pebbles jumping on water surface, scooping sand from stream bed, throwing stone to a tree trunk, collecting branches for firewood and making fire (Figure 6). While hiking in the hill forest, the children performed pulling garcinia leaves with stick, picking yellow pods from the forest floor, cracking the pods to see red seeds, picking dried branches, grasping stalk of durian fruits, throwing dried leaves into rapid and watching the leaves drifting on the water. In other words, through scanning the natural elements, the children able

to recognize loose parts of the elements and used as play tool. The result also suggests that the forest and orchard offered plenty of loose parts for the children to grasp and use them in their play activities.

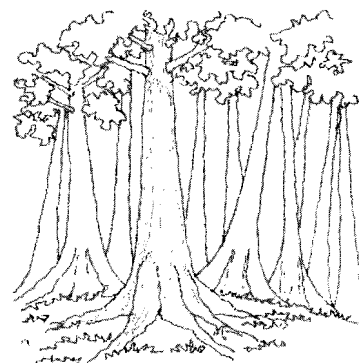


Figure 5: Slender trunk of huge monopodial tree attracted visual response

Water, attached objects and animals afforded nine functional properties each. Interestingly, in the stream, apart from swimming, the children searched shrimps and scooped the crustacean using plastic sieve, threw pebbles into water, scooped sand with both hands from stream bed, splashed water over peers, rested on boulder, felt cold after staying long in the water and felt water moving around their body. This finding is partially paralleled with study by Ismail (2008) that forest stream forest affords 87 functional properties.



Figure 6: Searching and scooping shrimps, bathing and resting on boulder, moulding sand were performatory and exploratory affordances at stream

The affordances were balancing on boulders, sitting on boulders to eat lunch, cutting bamboo poles, making a cloth line from bamboo pole, feeling irritation after cutting bamboo, standing on footbridge, observing huge tree and ducking under fallen logs. Each affordance involved sensorial and motoric actions, simultaneously. For example, sitting on boulder begun with scanning and selecting suitable boulder to sit; two sensorial actions. The actions triggered a child to climb and then sat on the boulder; two motoric actions. In

other words, through active detection of information and movement (Kytta, 2003), a boulder in a forest stream offered four properties for a child to experience. Perception and dexterity in the natural settings allowed the children to exploit nature and knew the utilitarian value of elements (Kellert, 2002). Additionally, the direct experience in nature permitted the children to value the functional properties of naturalness of the forest and orchard; scanning, hearing (Figure 7), climbing, cutting, sitting, manipulating, standing, observing and ducking.



Figure 7: In the forest children hear sounds of animals such cicadas and birds

6.3. Types of Affordances

As can be seen in Figure 8, the forest and orchard offered 15 times more positive affordances ($n=61$) than negative ones ($n=4$) to the children. The positive affordances overwhelmed the negative ones suggesting the functional properties of the forest and orchard were effectively perceived and utilized by the children. In other words, the children perceived the orchard and hill forest as places that afford a variety of functional properties for play and learn about nature. The four negative affordances were fear of leeches, fear of thorny rattan, tired to proceed hiking the forest hill and tired after climbing down the slope. However, the negative were contemporary stimuli attention because the positive ones overwhelmed the children's fear and anxiety. The vast difference between the positive and negative affordances suggests that children have recognized the forest and orchard as play spaces offering fascinating sensorial and motoric activities.

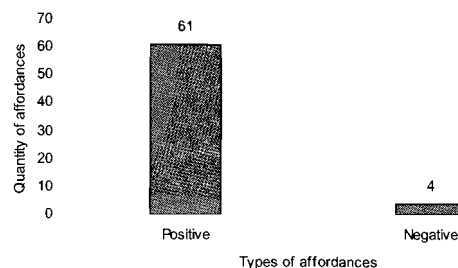


Figure 8: Types of affordances in the forest and orchard

7.0. CONCLUSION

In this study, the natural environment of a tropical woodland area is a suitable playscape for children. Most of the play activities involved performatory and exploratory performances including climbing and sliding down slippery slopes, picking fallen fruits, plucking leaves from trees, collecting pebbles from stream bed and throwing the pebbles of stream surface, and many more. However, only a few activities were productive that is creating play tools from the natural elements that the children recognized their properties for play. In sum, experiencing in natural environment allowed children to express their cognitive, physical and social skills.

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