

Evaluating affordances of stream and river pertaining to children functioning in natural environment



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Introduction

- Experiencing natural environment is a vanishing act for many children.
- Direct contact with natural elements and factors stimulate children's developments: physical, cognitive and social.
- Nature is diverse and complex. As such no two hills or streams are alike.

How children value nature

According to Kellert (2002), values of man toward nature come in 9 dimensions:

- 1. *Utilitarian* means the practical and material exploitation of nature such as the harvesting of banana fruit from a tree and consume it as food.
- 2. *Naturalistic* means the satisfaction from direct experience or contact with nature, for example, picking flowers from a shrub in a home garden.
- 3. *Ecologistic-scientific* means the systematic study of structure, function and relationship in nature such as field study on the ecosystem of a forest by school children.
- 4. *Aesthetic* means physical appeal and beauty of nature that is demonstrated when we love to view scenic landscape as garden which provide sense of peace and harmony.
- 5. *Symbolic* means the use of nature for metaphorical expression, language, and expressive thought, for example, expression of animal characters employed in preschool books (Kellert 1993).

How children value nature

- 6. *Humanistic* means strong affection, emotional attachment for nature such as the love of children to play in mud puddle when water collected after a heavy rain in a playground or garden.
- 7. *Moralistic* means strong affinity, spiritual reverence for nature such as forest should be conserved for the growth of trees and habitat of animals, and thus others can have the chance to experience the forest environment.
- 8. *Dominionsitic* means the physical control and dominance of nature, for example, we can explore or even exploit nature for human benefits.
- 9. *Negativistic* means the fear, aversion, alienation from nature such as children are afraid to go into a bush behind a house in fear of snake and spiders.
- Early childhood (3-6 years) children would value nature as utilitarian, dominionistic and negativistic. Middle childhood (6-12 years) children experience nature in humanistic, symbolic, aesthetic and scientific ways. And, late childhood (13-17) children view nature as moralistic, naturalistic and ecological-scientific modes.

Play as an interaction and transaction

Playing in natural environment permits children see nature as (1) diverse, (2) timeless, and (3) not man-made.

Playing in nature is an interaction with physical features and transaction with others. It allows children to (1) move with dexterity, (2) have own control, (3) imagine, (4) discover, (5) manipulate, and (6) accommodate. Playing is sensual and motoric activities involving three aspects of functioning: cognition, physical and social. Cognition is knowing between benefits and adversities. Cognition generates affection that is emergence of emotional and feeling capacities such as preference, affiliation, attachment, fascination and satisfaction.

Play and outdoor experience

- Playing is motion. Motion permits a child to locate himself freely in space, create his own boundaries, have access to diverse territories, manifest power, and explore his abilities.
- Play is a social activity.
- One of the play space for children afforded by nature is the stream and river.
- Literature on children's preferences for outdoor spaces suggests that the value of a place is not determined by its appearance or aesthetic qualities, but by its potential affording different activities (Gibson, 1979; Whitehouse et al. 2001; Ismail, 2006)

Research on Children Interaction with Natural Water Bodies

Problem Statement

- Experiencing natural water bodies generate feelings of attachment, affiliation and affection to children. The feelings are directly influenced by the functional properties—**AFFORDANCES**—of the water features and climatic factors of the water setting.

Aim of the Study

- To present an analysis of the affordances of stream and river as children's outdoor playspaces.

Research Questions

1. What are the functional possibilities that stream and river extend to a child?
2. What are the functional significances that social plays in the riverine environments extend to a child?
3. Does the stream and river offer rich and varied information about the character of an individual's efforts of engagement?

Methods

- Overt and covert responses of 4-12-year-old children (N=10) playing in 5 water bodies are were elicited by behavioural mapping and open-ended interview.
- The water bodies are: a 7-foot wide stream, two 15- and 25-foot wide hill streams, and two 30-and 40-foot wide rivers.

Measures and procedures

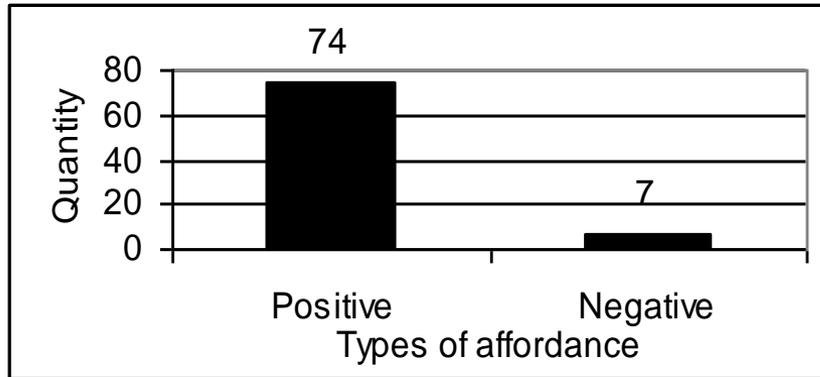
- A **phenomenological** approach was applied to elicit the behavioural response of the children with the water bodies. It explores and describes the situation or experience of the children.
- Behavioural mapping provided data on children's movements.
- Interview provided data of perceptual responses of children that is words.

Analysis: Two stages

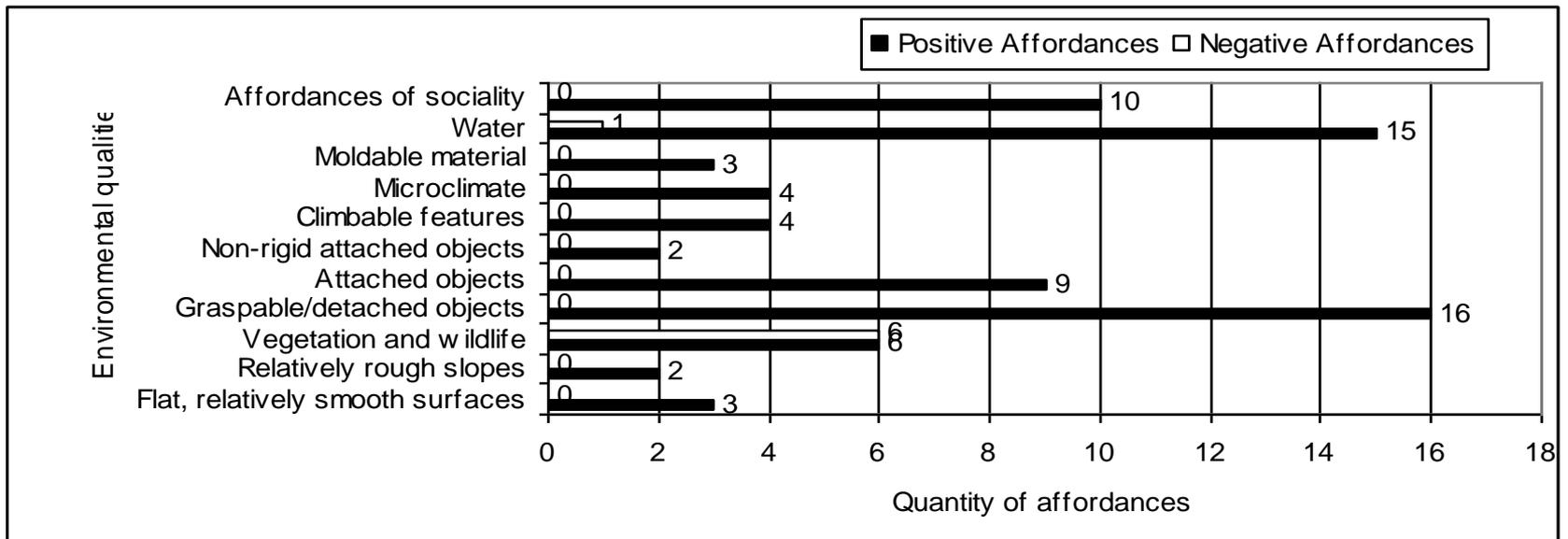
1. Positive and negative affordances
2. Taxonomy of affordances (n=10)
 - flat, relatively smooth surfaces,
 - relatively rough slopes,
 - greenery and wildlife,
 - graspable /detached objects,
 - attached objects,
 - non-rigid attached objects,
 - climbable features,
 - microclimate, moldable material,
 - water, and
 - affordances for sociality

Results

1. Positive and negative affordances



2. Taxonomy: Categories of Environmental Qualities



Graspable or detached objects (n=16)

Affords searching flat pebble on riverbed

Affords *throwing flat pebble on water surface*

Affords watching flat pebble jumping on water surface

Affords scooping sand with hands

Affords throwing sand to water

Affords feeling sand moving around feet

Affords seeing driftwood

Affords pulling and pushing driftwood

Affords floating on driftwood

Affords planting stick into riverbed

Affords making “house” from drift wood

Affords picking stones

Affords selecting different sizes of stones to make dam

Affords arranging stone to make a dam

Affords throwing rubber slipper on water surface

Affords seeing slipper drifting



Discussion

- Category graspable or detached objects (n=16)

- The graspable or detached objects were elements of the water bodies such as stones including *flat pebbles, sand, sticks and driftwood as well as man-made elements, rubber slippers*. The children utilised the elements for performatory, exploratory and productive activities. Some of the performatory and exploratory activities were *throwing flat pebbles on water surface, scooping sand with hands, floating on driftwood, and picking stones to make a dam*.



Discussion

- Category water (n=15)

- The obvious performatory activities were bathing in the rain or sun, *swimming, submerging, walking, and running* in shallow water. In the water, the children felt the moving water all over their bodies. Utilising a driftwood afforded the children to *float and drift*.
- And, the cooler waters of the hill streams afforded *feeling cold and shivering* after a while in the water, the only negative affordance.



Discussion

- Category vegetations and wildlife

- Vegetation and wildlife afforded viewing greenery, *climbing overhanging branch*, jumping from cantilevered branch, shading from afternoon sun, and picking leaves and flowers.



Discussion

- Category attached objects (n=9)
 - Attached objects like fallen logs and poles afforded nine activities. The logs afforded the children jumping from, somersaulting, balancing, ducking in water under the log, hanging with legs and arms, rocking on the end of a log, and basking.

Conclusion

- Positive affordances of the stream and river are more than 10 times more than negative ones.
- Performatory, exploratory and productive activities with the physical features of the water settings involved simple uses of materials.
- The activities are mostly done in group that is social play.
- Experiencing natural water setting stimulates three aspects of children functioning: cognitive, physical and social.

