

# “Holding Environments”: Creating Spaces to Support Children’s Environmental Learning in the 21<sup>st</sup> Century

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## Abstract

For many children across the globe, whether in low or high income nations, growing up in the 21<sup>st</sup> century will mean living in overcrowded, unsafe and polluted environments which provide limited opportunity for natural play and environmental learning. Yet Agenda 21, the Habitat Agenda and the United Nations Convention on the Rights of the Child all clearly articulate the importance of urban environments as the context for supporting children’s sense of place, community identity and empathy with the natural world. I will argue in this paper that these attributes are all key drivers for supporting children in their role as future decision makers and environmental stewards. Extending Winnicott’s concept of “holding environments” beyond the social and cultural aspects of communities as sites for placemaking I draw a link to the value of botanical gardens and other green spaces in cities as the “holding environments” for children’s environmental learning. I will construct an argument around the premise that to participate in, and contribute to, global sustainability - our children need places and the opportunity to engage, connect and respond to nature.

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## Introduction

Growing up in the 21<sup>st</sup> century will present significant challenges for children. Worldwide industrialisation, population growth, poverty, environmental degradation, uncertainty and risk are impacting on children’s childhood experiences. The urbanization of the world – the rise of rural-urban drift means the city landscapes are becoming more and more congested – green spaces becoming a rarity. Those spaces left in cities, particularly botanical gardens, have become key holding environments for the shared botanical diversity of the globe-like zoological gardens they are often represented as the global “Arks”. These green spaces in the urban landscape are key places for children and their families to fully experience and engage in living with nature (albeit a human constructed and designed nature). They have also become the “holding environments” for children’s environmental learning.

I will begin this paper by providing a short summary of the changing global landscape in terms of both the implications of population growth and inequitable use of resources, and the introduction of the key United Nations policies informing

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debates around Children's Rights and sustainable development. I will then provide some insights into the latest research around children's environmental learning and the importance of natural play. The paper will conclude with a short discussion on the important role of botanical gardens as key spaces for creating opportunities to support children's environmental learning in the 21<sup>st</sup> century.

### **Urbanisation of the Global Landscape**

Clearly the future global landscape will be predominantly urban. Cities will be the only way governments will be able to provide the resources necessary to cater for anticipated population growth. Currently, according to the United Nations, over one in four people are presently living in a town or city, yet this number is rising at a phenomenal rate. The world's largest cities (megacities) are growing by one million people per week and it is estimated that by the year 2025 cities alone will need the infrastructure to accommodate 4 billion people - most of these 4 billion city dwellers will be children (Satterthwaite, 1996; UNCHS, 1996). Accelerated rate of growth over the past 150 years: the 1st billion in 1850; the 2nd billion in 1930; the 4th billion in 1975; the 5th billion in 1987 and topping the 6 billion in 1999. Population is growing 1.5% annually - 89 million per year. By the year 2025 it is estimated there will be over 9 billion people living on the Earth. On average one third of the population in high income nations are children - in low-income nations this can increase to as high as sixty percent (Dallape, 1996). Influenced by population growth and the impact it has on the environment and the world's limited natural resources there is a huge increase of impoverished people's. It is now thought that six out of ten of our future children will grow up in cities, in poverty, and at risk of environmental hazards (Satterthwaite et al, 1996). Of the 5.7 billion people on the planet, an estimated 1.3 billion live in poverty, with income and consumption levels below nationally defined poverty lines (approx \$1 USD for day). There are many faces of poverty: women, children, youth, the disabled and the elderly; Indigenous peoples, migrants and refugees - those whom "progress" has pushed to the periphery. It was estimated in 1996 that 300 million children in cities worldwide were living in absolute poverty (UNICEF, 1996) - this number is increasing and with the onset of worldwide epidemics in HIV AIDS and the recent wars this is probably a low estimate.

### **Children's Urban Experience**

Dear World

Our world is dying because of us all. Don't throw bombs in the world and don't cut down trees. Don't kill the world. When we kill our world where can we live and where are we going to sleep? Your loving friend Linda Mncube, Age 11, Soweto, South Africa. (Temple, 1992, p. 10)

Because children across the globe, whether in high or low-income nations, are living in overcrowded, unsafe and polluted environments they have little opportunity for learning, play and recreation in natural environments. Dominant discourses abound with discussions of the forces of economic rationalism and globalisation in late modernity. We are living in what many may term a "risk society" (Beck, 1992). Children, specifically urban children, are the most vulnerable to this environmental and social degradation both in terms of likelihood of physical harm and the constraints these risks place on their capacity to reach their fullest potential. A consequence of this "urban risk" is people's retreat to "home environments", with many parents often prescribing and circumscribing children's access to the environment (Malone

& Hasluck, 2002). Play in neighbourhood spaces is increasingly becoming a thing of the past. Children are encouraged to only participate in regulated play environments in their homes, friend's houses and commercial facilities (often in the form of inside commercial playgrounds) (McKendrick, Bradford & Fielder, 2000; Malone, 1999; Malone & Hasluck, 2002). This type of regulatory practice may help to "protect" children from becoming victims of environmental and social hazards but the real consequences of restricted mobility is the lack of children's interaction with their local environment. This was clearly articulated by Malone & Tranter in their recent report on children's environments in Australian cities:

Spontaneous unregulated play in neighbourhood spaces, particularly in affluent areas of cities, is increasingly becoming an activity of the past. Many children have lost access to traditional play environments, including streets and wild spaces, partly through parental fears about traffic danger, bullying and "stranger danger", partly through the loss of natural spaces and partly through perceptions of what is best for children [and] when neighbourhoods aren't supportive of children's needs, children are limited in their capacity to experience and explore their environments and engage in cognitive play and outdoor learning – behaviours that lead to the development of environmental cognition. (Malone & Tranter, 2003b, p. 284)

The landmark UNESCO *Growing Up In Cities* project conducted in eight countries around the world in 1996 provided key qualitative indicators of quality of life from a child's perspective (Chawla, 2002). The first study of this kind in terms of size and cross-cultural significance revealed that children can articulate their ideas and concerns about their environment for themselves and their communities and were able to suggest ways to overcome these problems. One of the positive physical indicators of a quality environment identified by the children was the capacity it provided for them to freely access green spaces. Children also illustrated a strong sense of responsibility and wanted to participate in changing their community and saw this as an important part of their own education (Chawla, 2002). Research studies reinforce the view that children's quality of life in cities (including free play) should be judged on more than the loss of access for children to the natural environment's and its effects on children's health but should include the implications of this on children's sense of connection, environmental responsibility and environmental literacy (Malone, 2001). These cognitive aspects of natural learning surely will be critical qualities demanded of our young fellow citizens who will need to deal with difficult decisions about the future sustainability of our planet.

At this point the paper will deviate from the focus on children in the environment to reflect on the current political landscape in terms of the number of United Nations declarations and conventions that are influencing current debates on children's right and sustainable development. The paper will then return to this thread of children's play and environmental learning.

### **Children's Rights and a Sustainable Future**

I like to smell flowers. When I smell flowers. I feel easy. I'd like to be a bee to fly around the world and smell all the flowers. I like to touch the tree trunk and the water in the river. When I feel the water in the river, I can feel the freshness of the water. I imagine a school of fish swimming in the water. I'd like to touch those fish. When I smell bad things in the air, I feel uneasy. I don't like to live in such an atmosphere. I want to clean the dirty water and make the air fresh. - Truong van Thuan, Age 13, Vietnam. (Temple, 1992, p. 10)

Recent research and publications (Satterthwaite et. al., 1996; UNICEF, 1997; Malone, 2001; Chawla, 2002; Malone & Hasluck, 2002; Swart-Kruger, 2002) emerging from the multi-disciplinary field of children's environments reveal that like Truong, children around the world have similar wishes no matter where they grow up: They want clean water and enough food to eat; They want to be healthy and the space to learn, develop and play; They want friends and family who love and care for them; They want to participate in community life and be valued; They want to collaborate with adults to make the world a better place for all; They want peace and safety from threats of violence; They want access to a clean environment where they can connect with nature; They want to be listened to and their views taken seriously.

Ideally the places we design and create for our children to live should be the places where children can have access to environments that provide these simple wishes. They should also be places where children feel they have a positive future, a place where they can grow and have their own families. The principles of sustainable development clearly demand this. These principles state that the simultaneous achievement of environmental, social and economic goals should meet the needs of the present generation without compromising those of future generations. Children have a special interest in these goals – they are the future contributors, decision-makers and citizens of the world – they will also live in the world we create and design for them. The goals of sustainability insist that national governments maintain the integrity of the social, economic and environment fabric of their global and local environment through processes, which are participatory and equitable. The principles of the Convention of the Rights of the Child (CRC) reinforces this responsibility of the States Parties when it challenges them to uphold the child's right to live in a safe, clean and healthy environment and to engage in free play, leisure and recreation in the environment. According to the CRC a child's well-being and quality of life is the ultimate indicator of a healthy environment, good governance and sustainable development (UNICEF, 1992; UNICEF, 1997). If the goals of sustainability are not achieved then it will affect children more profoundly than other members of the global community. There is clearly a convergence and in many ways a symbiotic relationship between the principles of sustainable development and children's rights.

The connection between children's rights and sustainable development has been formally articulated in a number of global declarations and documents emerging from intergovernmental summits and meetings. Perhaps the most significant documents for stimulating discussions on children and sustainable development include *The Plan for Action* that resulted from the World Summit for Children and the Rio Declaration and the action plan of *Agenda 21* both endorsed at the Earth Summit in Rio de Janeiro in 1992. Principle 21 of the Rio declaration clearly reinforces the role of youth in sustainable development; "The creativity, ideals and courage of the youth of the world should be mobilised to forge a global partnership in order to achieve sustainable development and ensure a better future for all" (UNICEF, 1992). The introduction and the entire content of Chapter 25 add further support:

Chapter 25.1. Youth comprise of nearly 30 percent of the world's population. The involvement of today's youth in environment and development decision-making and in the implementation of programmes is critical to the long-term success of Agenda 21. (UNICEF, 1992)

More recently, an emerging focus on urban environments has given rise to the development of the *Habitat II Agenda* and, specifically with children in mind, the *Children's Rights and Habitat Report*. Presented by UNICEF at the United Nations Conference on Human Settlements at Istanbul in 1996, the *Children's Rights and*



*Habitat Report* draws attention to the important role children have in sustainable development: "Children have a special interest in the creation of sustainable human settlements that will support long and fulfilling lives for themselves and future generations. They require opportunities to participate and contribute to a sustainable urban future" (UNICEF, 1997, preamble).

At the local level, the goals of sustainable development and children's rights are expressed through *Local Agenda 21* - the action plan for local governments, communities and all stakeholders to promote and implement sustainable development; and UNICEF's Child-Friendly Cities Initiatives - a program of action encouraging Mayors and community organisations to involve children in partnerships on environmental decision making. These documents devote special attention to the needs of children, environmental care and participatory action. Children are acknowledged as having both the greatest stake in long term environmental stability and the capacity to act as protagonists in achieving that stability (Bartlett et al., 1999). These global initiatives provide a framework for supporting policy development. The test for local governments is to put them into action. Local governments and their agent organizations have a role to ensure the principles of *Local Agenda 21* and the spirit of the *Conventions on the Rights of the Child* are the impetus to create appropriate mechanisms for children's participation in building a sustainable and equitable urban future.

What these documents do is provide the "context" for arguing that at a political level we not only have a moral obligation but also, as signatories, we are committed to achieving the long and short-term goals of sustainable development and children's rights.

### Children and Natural Play

As I sat and helped the kids key out the lizards, then let them go, it came to me that I had had no such comparable experience as a child ... my own children's intense herpetological interest in catching, handling and naming lizards still baffles me [maybe it is as E.O. Wilson has suggested] ... "The snake and the serpent, flesh-and-blood reptile and demonic dream-image, reveal the complexity of our relation to nature and the fascination and beauty inherent in all forms of nature. Even the deadliest and most repugnant creatures bring the endowment of magic to the human mind." (Nabhan & Trimble, 1994)

Children have a unique, direct and experiential way of knowing the natural world (Malone & Tranter, 2003a, 2003b). This affinity with nature is not judged by its aesthetics but rather by the nature of their interaction with nature as a tangible and ever-changing phenomenon (White & Stoeklin, 1998). The child acquires environmental knowing through experiences with nature *directly* (observations, sensory stimulation, and movement in space) and *indirectly* (education, interpersonal communication, popular media). The value of "play" is often overlooked as a significant or authentic means through which children can directly experience their world. Play is often viewed as just "fun" yet as Cunningham, Jones and Taylor, (1994, p. 82) clearly articulates: "it is also a significant shaper of adult intelligence, values and self-sufficiency". Furthermore state Malone and Tranter (2003b, p. 6) "Play is the means through which children learn - it is the process of doing, exploring, discovering, failing and succeeding ... play enhances problem solving and promotes opportunities to experiment with creative thought". Erikson (1963) proposed that children's play is the early expression of the human capacity to deal with experience and control their reality through experiment and planning. When viewed in this way, play is a highly productive part of growing up; it has often been referred to as "children's work".

(Bartlett et al., 1999). It is also the activity through which all human (and also other animals) learn and exchange experiences. Building a group hut or den may look like fun but it is also about a collaborative venture in survival. When lion clubs play fight they are learning how to defend themselves, similarly when children draw around their shadow, build mud cakes or watch a chick born from an egg they are learning through experience about natural cycles, materials and the weather and their own relationship to these environmental phenomena.

Numerous studies have found that children often prefer to play in natural or wild spaces where they can engage in direct contact with natural objects (Cunningham et al., 1994; Maxey, 1999; Tranter & Malone, 2004) Such spaces appeal to children because of their diversity and their feelings of timelessness (White & Stoecklin, 1998) and because they offer more opportunities for environmental learning (Moore & Wong, 1997). Figure 1 provides an example of a child's drawing of their favourite place and illustrates clearly how a relationship exists between being in a place and building environmental knowledge about a place. Access to nature has been shown to be a key aspect of growing up and many links for adults to natural experiences in childhood have been shown to be significant in terms of their creativity and development of environmental responsibility (Sebba, 1991). Current research with children focusing on primary age children views about environmental issues illustrates that children have a keen sense of the nature of environmental issues (Malone, 2004) and when asked how they learn best about the environment overwhelmingly responded with being in the environment. Amber's is a typical response:

You have a look at nature's way of living. You see more and discover things. I like to touch, feel and smell all the things. I like to feel different leaves and twigs and discover animals that camouflage – Amber, age 7 years, Frankston, Australia. (Malone, 2004)



FIGURE 1: Drawing of my favourite place, Elizabeth Age 8, Cook Islands (Malone,

When asked what type of environment they would like to play in, children are able to identify specific elements (Titman, 1994, p. 58):

*A place for doing*, which offered opportunities for physical activities, for doing all kinds of things and which recognized their need to extend themselves, develop new skills, to find challenges and risks;

*A place for thinking*, which provided intellectual stimulation, thing which they could discover and study and learn about, by themselves and with friends, which allowed them to explore and discover and understand more about the world they live in;

*A place for feeling*, which presented colour, beauty and interest, which engendered a sense of ownership and pride and belonging in which they could be small without feeling vulnerable, where they could care for the place and people in it and feel cared for themselves; and

*A place for being*, which allowed them to "be" themselves, which recognized their individuality, their need to have a private persona in a public place, for privacy, for being with friends, for being quiet outside of the noisy world for being a child.

Numerous research studies support the view that there are cognitive and psychological benefits for people due to natural environmental experiences (Wells, 2000). Prisoners, hospital patients, office workers and children have been found to have a greater sense of wellness and to achieve higher cognitively when they have access (even if only visually) to naturalness. The way in which people interact, particularly children, in terms of social and physical prowess is also directly influenced by the natural elements and design of a park or garden. Herrington and Studtmann (1998) noted in their study on children in the US that when children played in an environment

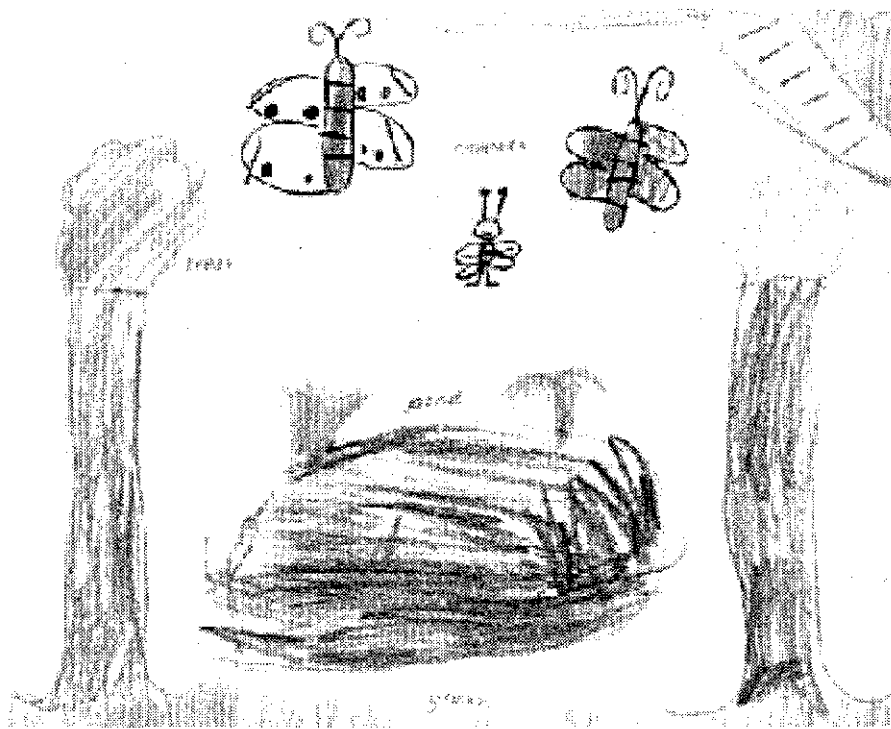


FIGURE 2: Drawing of my ideal play space, Kate, Age 5, Melbourne , Australia (Malone & Tranter, 2003b)



dominated by play structures rather than natural elements such as plants and bushes, physical competence was the means through which social hierarchy was established. The focus of the interaction with the environment and the play that ensued became competitive and little attention was paid to the environment as a space for learning or interaction. However, after an open grassy area was planted and became available for the children they played very differently in these “vegetative rooms”. Fantasy play and socialization developed. More importantly the social hierarchy became based less on physical prowess and more on a “child’s command of language and their creativity and inventiveness in imagining what the space might be... children who were dominant in the equipment based play yard were not always the dominant children” in the yards with the new plantings” (Herrington & Studtmann, 1998, p. 203). These research findings were also supported through my own research into schoolgrounds (Malone & Tranter, 2003a; 2003b) where it was found that in schools where there was little or limited access to natural elements children were more likely to engage in anti-social or destructive behaviour and felt less able to engage in imaginative or creative play activities. These children also displayed a lack of connection, belonging or ownership for their immediate environment (Malone & Tranter, 2003a; 2003b).

Research studies also articulate that maximising environmental learning including developing knowledge, creativity and imagination, constructing and interacting with natural and found objects can be directly identified as a response to the *affordance* that a particular environmental site can provide for the child (or adult). Affordance is a term developed by Gibson (1979) who argued that the affordance of an environment is those elements it offered or provided for the user. Affordances therefore are ecological resources from a functional point of view. Wohlwill and Heft (1987, p. 319), building on Gibson’s work on affordances, stated that: “affordance stresses the action possibilities that environmental features and environmental settings encourage or permit [and



FIGURE 3: A “den” constructed by children during “play’ in the Pine Forest of Orana Primary School, Canberra, Australia (Malone & Tranter, 2003b).



that] the affordance framework may aid the designer in explicitly formulating design features with user characteristics in mind". They go on to explicate two other key features of natural spaces: *sensory stimulation* – the potential of environmental features and settings to provide sensory stimulation through various colour, shape, pattern, dimension and texture; and *response feedback* – creating an environment that is responsive and malleable to the user's actions so it provides a constant feedback for the user in terms of abilities, competencies, capacities and behaviours. See this beautiful description of the value of a "tree" in the life of a children's exploration and the image from a school in Canberra where children responded to their schoolground environment:

Trees can be climbed and hidden behind; they become forts or bases; with their surrounding vegetation and roots, they become dens and little houses; they provide shelter, landmarks and privacy; fallen, they become part of an obstacle course or material for den-building; near them you find birds, little animals, conkers, fallen leaves, mud, fir cones and winged seeds; they provide a suitable backdrop for every conceivable game of the imagination. (Ward, 1990)

### Botanical Gardens as "Holding Environments"

Winnicott (1974) has described the role of transitional processes in the evolution of child's play. He supports the importance of play in the unfolding development of a child's imagination, and how all this in turn opens avenues for the gradual emergence of individual creativity, not only through artistic, scientific and religious avenues of expression, but also in the enjoyment of life generally. Such creative avenues he views seem to involve the adaptive use of creative imagination in exploring and enhancing the appreciation of reality, rather than having this circumscribed, in misleadingly precise terms, through repression and denial.

Cosco and Moore (2002) also write of Winnicott: "He considers play as a transitional phenomenon because 'it is not inside; nor is it outside' of the individual". Winnicott (1974) links the potential space between the self and the environment as having a key role in developing a cultural identity embedded in place. The richer and more diverse this space is socially and physically – the more the potential to create a richer and more diverse environmental identity (Cosco and Moore, 2002). Winnicott uses the term "holding environment" to conceptualise the nurturing space first constructed by the mother when holding her baby and then expanding to incorporate the family and the community – including the physical and social environment. "The holding environment" writes Cosco and Moore (2002, p. 55) "of the neighbourhood can be a nurturing space for expanding creativity and establishing a sense of belonging. It contains the products of the collective imagination – in other words, culture". Cosco and Moore (2002) reflecting on their research study with children in the low income neighbourhood of Boca-Barracas, Argentina, utilize Winnicott's notion of the holding environment:

Our conclusions point to the critical importance of the holding environment of extended family and child friendly institutions (school, church, community centres) in helping children from low-income families to experience transitional space of play and culture, and therefore to survive the lack of materials resources in their lives. (2002, p. 55)

Cosco and Moore (2002) concluded that revitalizing "holding environments" where culture could develop through play was a critical component in supporting a culturally rich society and that "...a culturally rich society supported healthy development and

helps children gain positive identification and higher self-esteem. Conversely, creative play and free individual expression enriches the culture” (2002, p. 55). Using the concept of holding environments and applying it to the importance of “green, natural spaces” we can appreciate the vital role of the transitional space of play in linking the innate *inside* connection children have with nature and the *outside* link they have with the physical world created for them. In terms of the ecological sphere of where childhood operates the holding environment is juxtaposed between microsphere (family) and the mesosphere (community) (see Figure 4).

The view that green spaces in the mesosphere are critical “holding environments” is built on the premise that unregulated play is a critical element to enhance environmental learning and ongoing sense of connectedness to place. That is to say, creating environmentally rich and diverse green spaces will support environmental learning and help children gain a sense of connection, ownership and knowledge about their environment. Conversely children engaging in creative and imaginative play and learning about their environment will help them to enrich, construct and create living green spaces in our cities (now and in the future). To support children’s environmental learning is to acknowledge the importance of unregulated natural play as a key to children’s development of a sense of place. With limited options available in a rapidly urbanising landscape - Botanic Gardens are a critical site for providing diversity and choice in children’s environmental experience.

Botanic gardens already have the role of “holding” the environmental wealth of human culture – plants and animals packaged and designed for human consumption. With much of the wild places of the Earth lost (or on the way out) and because of the very limited capacity for most children (and their families) to be able to access places outside of the urban landscape- botanic gardens (parks and gardens) have become critical environmental holding environments. Botanic gardens are “potential” sites for environmental learning. The challenge is to ensure that the means and opportunity to access these spaces is based on contemporary research on children’s needs and their preferred forms of environmental learning. That is, the one off “educational” experience

provides a certain type of learning but does little towards the nurturance of the child’s connection and appreciation of nature. Immersion and engagement in the environment regularly in a free and emergent way provides a very different experience of nature, one more aligned with the way children naturally learn.

The principles for planning these spaces for children should be based on what the research with children tells us (not what adults think children want or need). These principles could include creating spaces that allow children to:

- develop intimate, reflexive and lasting relationships with nature;

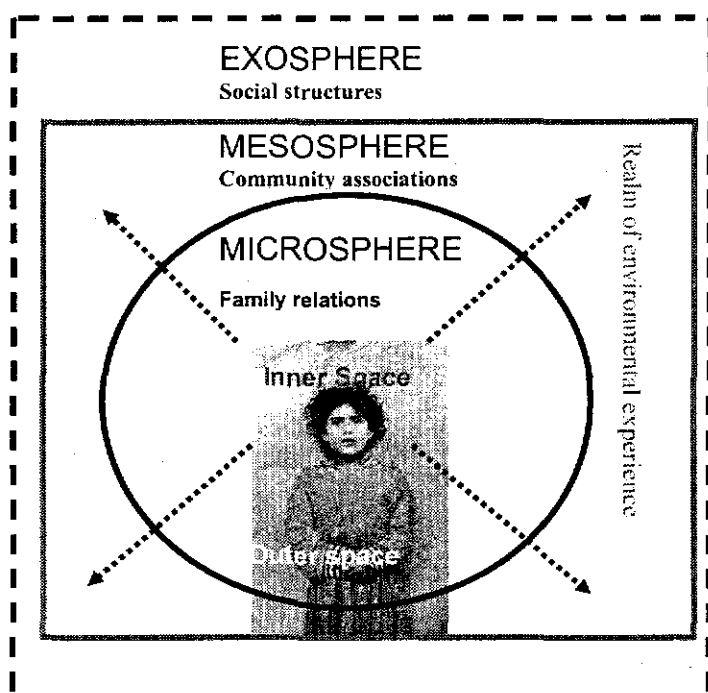


FIGURE 4: Sphere of children’s holding environments

- imagine, create and explore their sense of self in relation to the natural world; and
- construct and design spaces which can respond to their actions and activities.

Children have already told us what this space should look like (Titman, 1994). They want:

- natural landscape with trees, flowers and other things that grow;
- animals, ponds and other living things;
- natural colour, diversity and change;
- surfaces they can use but don't hurt; and
- places and features to sit in, on under, lean against- where there is shelter and shade.

We can be inspired by some of the innovative and creative examples of well-established and new children's gardens around the world. For example the Everett Children's Adventure Garden in New York Botanic Garden has a long history of being a space that provides for both formal and informal learning opportunities for children and their families. The newest addition to gardens for children, the Ian Potter Foundation Children's Garden at the Royal Botanic Garden in Melbourne is due to open in September 2004 and provides a unique model of how a botanic garden is designing spaces based on contemporary research across the fields of environmental psychology, education, childhood studies and sustainable development. Figure 5 provides a concept map of the developing garden and this is followed by the vision statement.

The vision for the Ian Potter Foundation Children's Garden states:

...a place where children can delight in nature and discover a passion for plants. It will be a garden that celebrates the imagination and curiosity of children and fosters the creative nature of play.

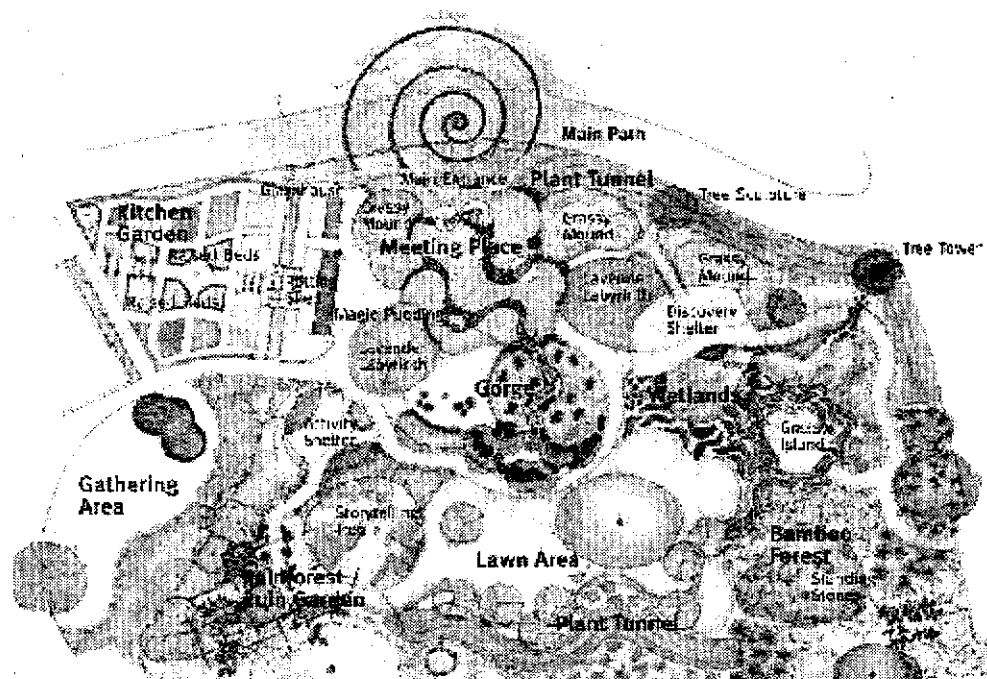


FIGURE 5: Map of Ian Potter Foundation Children's Garden Royal Botanic Gardens Melbourne, Australia



## Conclusion

Through their interaction with the environment children become active participants in designing their world and their relationship to it. Children have a deep urge for competence and understanding that drives them to watch, touch, intimate, experiment and explore. "Play" is the term we use to describe this intimate dance that children perform and the passionate engagement and curiosity they have when experiencing being in the world. It is the shared responsibility of all societal members to ensure that children's rights to a safe, clean and healthy environment where they can engage in free play is acknowledged at all levels of the social sphere (micro, meso or exo). This responsibility is not just because having an opportunity to engage in free play in the natural environment is a statutory right (as identified in the Convention on the Rights of the Child) but also because there is a strong connection between a child's likelihood to develop a sense of empathy, belonging and responsibility to their environment and their direct experiences in it.

In a rapidly urbanizing world it is critical that plans are made to ensure that children aren't the losers in the battle over land use and resource allocation. To support children's environmental learning in city landscapes new spaces need to be created and old spaces maintained. Botanic gardens have one of the most critical roles to play in this battle as the "holding environments" of both our botanical history, lost biodiversity and as the potential "holding environments" of children's environmental learning, they will become the transitional spaces of the city landscape where children are able to develop their environmental potential. Supporting children's environmental learning through a model of Botanic gardens as "holding environments" means identifying the constraints and barriers that act to disconnect children from these natural spaces. Constraints that impede children getting to the gardens such as; lack of transport, parental support, finances or information and those that serve to restrain children's use of the gardens once they arrive. That is, once getting to these spaces children should be provided with authentic "play" opportunities that maximize the capacity for children's environmental learning. If botanic gardens become too "precious" and interaction is kept to a minimum then we have gained very little. Therefore, the planning, design and management of botanic gardens will be a key to the role that they will play in children's lives in the future.

I have argued that children's capacity to contribute to environmental sustainable development will be largely dependent on the quality of their childhood environmental experiences. In a highly mechanised world that is rapidly becoming urbanized it is easy to overlook the simple, silent sounds, systems and seasons of nature that exist around us. I believe recognizing the role of "holding environments" and creating spaces to support children's environmental learning in the 21<sup>st</sup> Century will be one of the most important tasks of those managing green spaces in the city landscape.

*Keywords:* Urbanisation, sustainable development, environmental education, childhood.

## References

- Bartlett, S., Hart, R., Satterthwaite, D., De La Barra, X., & Missair, A. (1999). *Cities for children: Children's rights, poverty and urban management*. London: UNICEF/Earthscan.
- Beck, U. (1992). *Risk society: Towards a new modernity*. London: Sage.
- Chawla, L. (2002). *Growing up in an urbanising world*. London: UNESCO/Earthscan.
- Cosco, N., & Moore, R. (2002). *Our neighbourhood is like that!* In L. Chawla (Ed.), *Growing up in an urbanising world*. London: UNESCO/Earthscan.

- Cunningham, C., Jones, M., & Taylor, N. (1994). The child friendly neighbourhood: Some questions and tentative answers from Australian research. *International Play Journal*, 2, 79–95.
- Dallape, F. (1996). Urban children: A challenge and an opportunity. *Childhood*, 3(2), 283–294.
- Erickson, E. (1963). *Childhood and society*. New York: W Norton and Company.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston MA: Houghton Mifflin.
- Herrington, S., & Studtmann, K. (1998). Landscape interventions: New directions for the design of children's outdoor play environments. *Landscape and Urban Planning*, 42(204), 191–205.
- Malone, K. (1999). Growing up in cities as a model of participatory planning and "place-making" with young people. *Young Studies Australia*, 18(2), 17–23.
- Malone, K. (2001). Children, youth and sustainable cities. *Local Environment*, 6(1), 5–12.
- Malone, K. (2003). *Cook Islands: Children, youth and community views on environment, development and tourism*. Report prepared for UNESCO Coastal and Small Islands - Small Islands Voice project 2002–2003. Bundoora, VIC: RMIT University.
- Malone, K. (2004). *Environmental issues through the eyes of children*, unpublished report. Bundoora: RMIT University.
- Malone, K., & Hasluck, L. (2002). Australian youth: Aliens in the suburban environment. In L. Chawla (Ed.), *Growing up in an urbanising world*. London: Earthscan. [Invited contribution]
- Malone, K., & Tranter, P. (2003a). School grounds as sites for learning: Making the most of environmental opportunities. *Environmental Education Research*, 9(3), 283–303.
- Malone, K., & Tranter, P. (2003b). *Children's environments: A study of children's environmental learning in relation to their schoolground experiences*, ARC Research Report. Bundoora: RMIT University.
- Maxey, I. (1999). Playgrounds: from oppressive spaces to sustainable places? *Built Environments*, 25(2), 18–24.
- McKendrick, J., Bradford, M., & Fielder, A. (2000). Kid customer? Commercialisation of playspace and the commodification of childhood. *Childhood*, 7(3), 295–314.
- Moore, R., & Wong, H. (1997). *Natural learning: Creating environments for rediscovering nature's way of teaching*. Berkeley, California: MIG Communications.
- Nabhan, G., & Trimble, S. (1994). *The geography of childhood: Why children need wild spaces*. Boston: Beacon.
- Satterthwaite, D. (1996). *The scale and nature of urban change in the south*. London: International Institute for Environment and Development.
- Satterthwaite, D., Hart, R., Levy, C., Mitlin, D., Ross, D., Smit, J., & Stephens, C. (1996). *The environment for children: Understanding and acting on the environmental hazards that threaten children and their parents*. London: UNICEF/Earthscan.
- Sebba, R. (1991). The landscapes of childhood: The reflection of childhood's environment in adult memories and in children's attitudes. *Environment and Behaviour*, 23(4), 395–422.
- Swart-Kruger, J. (2002). Children in South African squatter camp gain and lose a voice. In L. Chawla (Ed.), *Growing up in an urbanising world*. London: UNESCO/Earthscan.
- Temple, L. (1992). *Where would we sleep? Children on the environment*. Sydney: Random House/UNICEF.

- Titman, W. (1994). *Special places; special people: The hidden curriculum of school grounds*. Surrey, UK: WWF/Learning through Landscapes.
- Tranter, P., & Malone, K. (2004). Geographies of environmental learning: an exploration of children's use of school grounds. *Children Geographies*, 2(1), 131-156.
- Ward, C. ( ). *The child in the country*.
- Wells, N. M. (2000). At home with nature: Effects of "greenness" on children's cognitive functioning. *Environment and Behaviour*, 32(6), 775-795.
- White, R., & Stoecklin, V. (1998). *Children's outdoor play and learning environments: Returning to nature*. White Hutchinson Leisure & Learning Group. Retrieved 3 December 2001, from <http://www.whitehutchinson.com/children/articles/outdoor.shtml>.
- Winnicott, D. W. (1974). *Playing and reality*. London: Penguin Books.
- Wohlwill, J., & Heft, H. (1987). The physical environment and development of the child. In D. Stokols & I. Altman (Eds.), *Handbook of Environmental Psychology: Volume 1*. New York: Wiley.
- UNCHS (1996). *An urbanising world: Global report on human settlements 1996*. Oxford: Oxford University Press.
- UNICEF (1992). *Convention on the rights of the child*. New York: United Nations.
- UNICEF (1996). *Towards child-friendly cities*. New York: UNICEF.
- UNICEF (1997). *Children's rights and habitat: Working towards child-friendly cities*. New York: UNICEF.
- Ward, C. (1990) *The child in the country*. London: Bedford Square Press.