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The Environment as a Tool for Health

Towards a Definition of the Individual Boundary Process

(L'environnement comme outil de santé
Vers une définition du processus de gestion des frontières personnelles)

par
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Faculté de l'aménagement

Mémoire présenté à la Faculté des études supérieures en vue de l'obtention du grade de
maîtrise en science appliquée (option aménagement)

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Université de Montréal
Faculté des études supérieures

Ce mémoire intitulé :

The Environment as a Tool for Health
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Vers une définition du processus de gestion des frontières personnelles)

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Membre du jury

Résumé

Depuis une trentaine d'années, certaines directives basées sur la recherche en design (RBD), quoique encore éparses, permettent la construction d'environnements mieux adaptés aux besoins humains. Un cadre de référence intégré est présenté ici, à la suite d'une revue des directives RBD pour hôpitaux, centres pour personnes atteintes de la maladie d'Alzheimer, lieux de travail et des environnements pour enfants.

Par analogie avec l'échelle de Maslow, une hiérarchie de besoins environnementaux est proposée, qui considère gîte et sécurité comme besoins de base. A un niveau supérieur on retrouve des besoins tels la lumière du jour, l'accès à la nature, l'interaction sociale, la privacité, le statut, la personnalisation, la territorialité et le 'chez-soi'.

La satisfaction de besoins environnementaux est décrite comme un processus de gestion des frontières personnelles (IBP). Dans la présente étude, des entrevues ont été menées auprès de 17 parents et 27 enfants. Les données recueillies au sujet de la santé, des humeurs et des comportements des deux groupes tels que perçus par les parents, ont été mises en corrélation avec les variables de l'IBP. De plus des analyses qualitatives ont été effectuées. Les résultats confirment le rôle d'un processus de régulation territoriale dans les environnements favorables.

Mots clés :

Bien-être; cadre bâti; environnement; frontière; personnalisation; privacité; santé; social; territoire

Summary

For the past thirty years, research-based design (RBD) guidelines have helped to build environments more responsive to human needs. However, no synthesis of this research exists. RBD guidelines from diverse environments are reviewed here and an integrative framework for supportive environments is proposed. Analogous to Maslow's hierarchy of needs, the proposed Hierarchy of Environmental Needs demonstrates basic environmental dimensions to be shelter; security & safety; daylight; and access to nature. Higher environmental dimensions are described as the need for social interaction; privacy, personalization; status; territoriality; and the 'meaning of home'.

The higher needs are examined in a study of 17 parents and 27 children in their homes. Health, mood and child behaviour are reported by parents for self and children. Physical environmental characteristics are recorded and a content analysis is performed. The results support the Hierarchy of Environmental Needs as a framework for supportive environments. Finally, personal boundary control, here named the Individual Boundary Process (IBP), is proposed to be a regulating process in supportive environments binding the concepts of territoriality, personalization, social interaction, and privacy.

Key Words :

Environment; health; personalization; privacy; social interaction; supportive environment; territory; well-being

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List of Abbreviations

BPE	Building Performance Evaluation
E-B	Environment & Behaviour
EDRA	Environmental Design Research Association
IBP	Individual Boundary Process
IEQ	Indoor Environmental Quality
LEED	Leadership in Energy and Environmental Design
P-E	Person-Environment Relationship
P-Ee	Person-Physical Environment and Psychosocial Environment Relationship
POE	Post Occupancy Evaluation
RBD	Researched-Based Design

Dedication

To Eric

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Finally, thank you to my husband Frank for being supportive of my work and to Eric, Deanne, and Alex for making my days meaningful.

Foreword

On December 26th 2000, my 3½ year old son was diagnosed with Acute Lymphoblastic Leukemia. That night at the hospital, I wept by Eric's bedside feeling helpless and lost. As time crept by, the healing began to take place within all of us as we familiarized ourselves with our new world of needles, syringes and medications.

During the four years of my son's treatment, we often spent several weeks at a time at the hospital. The staff always made every effort to make our stay pleasant. However it was only upon our return home when my son's spirits would rise. Colour would reappear in his cheeks and he would sing again in the bathtub.

A week would pass and a questionnaire would arrive in the mail from the hospital. How was your stay in the hospital? Was the staff helpful? Was the food good? I couldn't help thinking that a significant piece of the equation was missing from this questionnaire. What about the height of the bed for my little son; the glare of the overhead lights as he lay in his bed in his room; my fold-out bed with the crack at my back; the constant noises from staff, roommates and alarms that made getting a decent night's sleep so difficult? If they were interested in the quality of our experience at the hospital, why would these questions be missing? It seemed obvious to me that the hospital environment should be therapeutic and not make you unwell. Why would questions about our comfort be missing from the questionnaire? To be fair, I should mention that things were slowly changing at the hospital that showed that someone was thinking with this curative environmental paradigm.

We were living in Southern California at the time, so my son was being treated at the Children's Hospital of Los Angeles (CHLA). During the four years of chemotherapy and radiation treatment, the hospital underwent major renovations. The reception area was made more family friendly by installing a large tropical aquarium in the center of a new large play area with whimsical creatures for the children to climb and explore; admission areas were now angled to ensure visual and acoustic privacy; a healing garden with meandering paths was being landscaped out front. Not only could we see these physical changes, but we could *feel* the difference. Having to go to the hospital wasn't so bad after all. It was becoming a place of discovery and delight. Although it might seem odd to put the words 'hospital' and 'delight' in the same sentence, that is the effect that these physical changes had on us.

However, it wasn't only our hospital experience that spurred my interest in the curative powers of the built environment. After a long stay at the hospital, something would happen when we would return home. Upon entering his room, my son would gaze in awe at his toys again. The look on his face was wonder, delight, happiness, and relief all captured in one brief instant. There was something about home, in particular, his room or his toys that made him well. What was it about home that brought colour back to his cheeks and made him sing in the bathtub?

When my children slept at night, I would search for answers to these questions on the internet. I came across feng shui, baubiologie, green design, and sustainable design. But none could answer my questions. Most of these fields seemed to acknowledge the relationship between the physical environment and health at the basic level - the physiological level. This is not to belittle these fields. Toxicology, epidemiology, health & safety issues, sustainable and green buildings are all important fields of study and all strive for improvement within their 'health' paradigm. But they do not answer my questions, nor do they fit into my 'health' paradigm. It's not about the relationship between buildings and sickness. I wanted to understand the aspects of the physical environment that energize us, optimize our experience and make us well.

My curiosity about the relationship between health and the physical environment went beyond the hospital setting. Although my thoughts about the curative properties of home took shape during our hospital experience, I was interested in the potential of the physical environment to make a person well. Certainly the therapeutic benefits of design in the hospital setting should assist a person to recuperate from sickness, but I also felt that the physical environment should enhance any person's wellness in any place and at any time.

I was puzzled why so little information was available about a phenomenon that seemed so apparent to me. I was under the impression that architects and designers would know the answers to these questions so I started taking classes in an interior design program at the local community college. I quickly discovered that they did not have the answers either. Furthermore, as a mechanical engineer with marketing and management experience, I didn't belong in an interior design college. But having left the college, I was still no further ahead in my quest to understand the supportive relationship between people and the built environment.

Fortunately, before loosing all hope, I discovered the work of Jacqueline Vischer. Dr. Vischer recommended that I attend a conference organized by the Environmental Design Research Association (EDRA). EDRA is an international organization founded in 1968 with the mission of “improving understanding of the interrelationships between people, their built and natural surroundings, and helping to create environments responsive to human needs” (EDRA, 2007). I attended EDRA35 in New Mexico in 2004 before starting my master's degree at the University of Montreal, hoping to find some answers. At the conference, I found people asking the same kinds of questions as I. However, I observed that these people met in different groups. There were groups on children's environments, work environments, senior living environments, and hospital environments. I flitted in and out of these groups, noticing that they were developing different nomenclature and methods to answer often the same questions.

I was well into my second year of the master's program at the University of Montreal when it occurred to me why it had initially been so difficult for me to find the field that 'had all the answers' to my questions. Such a field does not exist alone. A multi-disciplinary field had emerged in the 1970's which went by many names, such as Architectural Psychology, Environmental Psychology, and Environment & Behaviour. It was in these early years when basic theories about person-environment relationships were developed. Thirty years later, many of the original theories still hold strong but the field had broken up into smaller groups. These sub-fields now study specific age groups in specific settings. For example, at the EDRA conferences there are now groups studying gerontological environments, children's environments, work environments, and hospital environments, to name a few. I felt that someone had to bring this interdisciplinary field back together again to share this accumulated knowledge. I decided that this someone would be me. I took on the daunting task of learning about these groups and synthesizing their major works into one integrative framework.

The more I learn about this field, the more I realize how young this field still is. There continues to be tremendous opportunity to learn and to explore. I hope that my work can contribute to the advancement of the field and will initiate further inquiry into the study of supportive person-environment relationships.

Always practical, my mother asked me “...but what will you do with this degree?” I still can't give her a precise answer, but I can tell her that there is a need for people with this knowledge and people who are willing to share what they have learned with others, as Jacqueline Vischer has with me.

Eric is now a healthy nine year-old boy. Very few people are aware of what he has been through now that we live in a new city. I will always be inspired by his strength and thank him for teaching me what really matters.

"We shape our buildings, and afterwards our buildings shape us"

Winston Churchill

CHAPTER 1

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Chapter 1 - Introduction

This (*environmental crisis*) is not the crisis of pollution that is of such great national concern today. It is a much more subtle crisis, arising from the fact that people always exist within an environment, and that usually they are in surroundings which are unhelpful or detrimental to what they are trying to do. The crisis here is the lack of fit between needs and settings, and it is much more subtle than poisoned water or air.

Fred (Fritz) Steele, 1973, (p.4)

1.1) Problem Statement

In the late 1960's and early 1970's, an increasing separation between designers and building users created the need to better understand the manner in which the built environment affects human behaviour and well-being (Gifford, 2002; Proshansky et al, 1970). A new field of study emerged. Due to its inter-disciplinary nature, this field goes by many names such as man-environment relations (Sommer, 1971), architectural psychology (Cooper Marcus & Sarkissian, 1986), design psychology (Isreal, 2004), design & behaviour (Preiser, 1987), environment – behaviour (Zeisel, 2006), and environmental psychology (Itellson, Proshansk & Rivlin, 1970; Gifford, 2002). Environmental psychology is defined as “the study of human behaviour and wellbeing in relation to the sociophysical environment” (Stokols & Altman, 1987). Environment-behaviour (E-B) is increasingly being used as the term to define the field (Bechtel, 1997; Wapner, Demick, Yamamoto & Minami, 2000). In this paper, the term ‘Environment-Behaviour’ (E-B) will be used to describe this field.

The result of over 30 years of E-B studies has been a better understanding of the influence of the sociophysical environment on human behaviour and well-being (Zeisel, 2006). The field has consequently helped to create more people-centered or humane built environments (Preiser et al., 1991). Humane environments possess a high degree of habitability, where ‘habitability’ is defined by Preiser (1983) as:

...those qualitative and quantitative aspects of the built environment which support human activities in terms of individual and communal goals... Habitability defines the degree of fit between individuals or groups and their environment, both natural and man-made, in terms of an ecologically sound and humane, built environment. (p. 87)

From the term 'habitability' stems the Habitability Framework which is a theoretical framework and a set of objectives for environmental design (Preiser, 1983; Vischer, 1989). The components of the tripartite model include: Health & Safety, Comfort, and Satisfaction (see Figure 1). 'High building quality' is obtained once all three levels are achieved. 'Building quality' will also be called 'environmental quality' here.

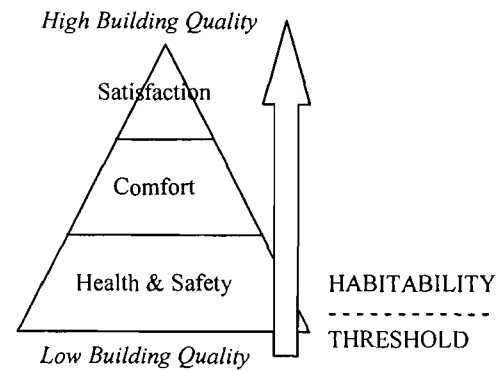


Figure 1 - The Habitability Framework
(Preiser, 1983; Vischer, 1989)

With this definition, 'environmental quality' is not solely described by physical measurements, such as achieving a specified temperature, humidity, or particulate size in the air. Nor is it solely achieved by considering cost savings during the building process. This is not to say that achieving measurable physical standards or that reducing costs is not necessary for environmental quality. These are important aspects to consider, but they are not the only determinants. Environments with high building quality are realized when the end-user is involved in the building process (Preiser & Vischer, 2004). Habitability is achieved with the integration of occupants' needs. Therefore, satisfying occupants' needs plays an important role in reaching a high level of environmental quality.

Perhaps one of the better-known models of human needs is Abraham Maslow's Hierarchy of Needs (Maslow, 1954) (Figure 2). In this model, basic needs must be met prior to attaining higher level needs. Basic needs are described by Maslow as food, shelter, warmth and sleep. The next level of needs is safety needs such as freedom from threats and financial security, followed by belonging, love, and self-esteem and with the culmination of the need for self-actualization. Higher levels of needs can only be achieved once lower levels are satisfied.

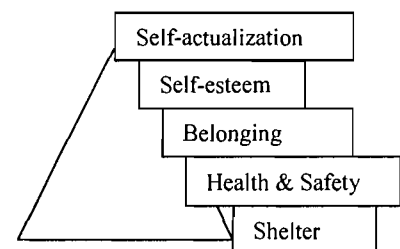


Figure 2 - The Hierarchy of Needs
(Maslow, 1954)

Maslow's work has been criticized for simplifying human needs by categorizing them as distinct entities (Neher, 1991), as well as for lacking empirical evidence to support his theory (Soper et al,

1995). But as appealing as it is in its simplicity, human needs will not be considered discrete satiable units here. Furthermore, the relationship between human needs and the built environment is dynamic. Vischer (1989) explains:

It might not be useful to define human needs as finite, quantifiable units to which something as concrete as a building can respond... People seek comfort from their environment; they change their environment, adapt it when they can, and adapt to it when they cannot (pp.38-39)

The relationship between human needs and the built form is characterized by change, rather than stability. A building should not be considered a static end product, but more as a part of an ongoing dialogue with building users. With this understanding, the building occupant plays an integral role in creating environmental quality. Recognizing this characteristic in the Person-Environment (P-E) relationship is key to achieving habitability.

Both the person (P) and the environment (E) will be described here using the transactional approach (Ittelson, Proshansky, Rivlin & Winkel, 1974; Stokols & Altman, 1987; Saegert & Winkel, 1990; Bechtel & Churchman, 2002): Bonnes, Lee, & Bonaiuto (2003) define the relationship between the person and the environment (P-E) as a system where the main assumptions for the person (P) are the three following points:

1. The person is to be considered as a dynamically organized system, primarily based on the 'goal-directed' nature of human behaviour, which is motivated, intentional, meaningful. It is oriented to integrating the 'doing' with the 'thinking'. This 'goal-directed' behaviour is a result of continuous confrontation/exchange, between internal 'needs' and environmental opportunities and objects. It is thus also affected hugely by the social context;
2. A central role is assigned to both (i) the cognitive processes and (ii) the affective and emotional processes. These are conceived as having a selective role in relation to perceived reality and are engaged in a 'continuous transactional process', between the characteristics of the person and those of the environmental events/objects. The dominant aim of this process is to 'construe' a person's relationship with the environment.
3. Change more than stability characterises the person in his/her transactions with the environment. (p.14)

Just as human needs are considered dynamic, the person (P) in the P-E relationship is also characterised by change more than stability. The transactional approach makes measurement challenging since the person can not be considered a static unit, ready and willing to be recorded and analyzed.

The word 'environment' (E) is defined in the Collins Canadian English Dictionary & Thesaurus as: "1. external conditions or surroundings; and 2. *Ecology*, the external surroundings in which a plant or animal lives, which influence its development and behaviour" (Collins, 2004). It is the

ecological perspective that acknowledges external influences on the person and consequently supports the systems approach. Bonnes, Lee, & Bonaiuto, (2003) describe three main assumptions about the environment (E) with the transactional approach as:

1. The environment is conceived as a spatial and time-related, dynamically organised system or 'setting' that includes physical, social and socio-cultural, or symbolic aspects;
2. It is perceived as unique by each perceiving person, but it is typically 'neutral': awareness of its characteristics occurring only when change, or novelty, is introduced.
3. It is conceived as an open system, more in terms of process than of characteristics; however it presents physical features which can be primarily conceived as 'resistant', 'supportive' or 'facilitative' with regard to participants' behaviours. (p.15)

The physical environment, or built environment, is more than a backdrop or a stage waiting for actors to play their roles and action to start. It is interactive and intrinsic to our everyday lives, our development, and our well-being. The transactional approach describes the environment in the P-E relationship as an open system that is constantly changing.

The term 'physical environment' is multifaceted and "can involve a wide variety of levels of scale from objects in a home, to rooms, the home itself, the neighbourhood, city, and beyond" (Werner, Brown & Altman, 2002). It can also include natural settings such as nature and parks. The term 'physical environment' is used here interchangeably with 'built environment'.

In search of a better understanding of this P-E system and with the goal of producing a more humane built environment that better addresses this 'subtle environmental crisis' as Steele called it, authors from the field of E-B have proposed needs-based environmental models (Cooper, 1975; Preiser, 1987; Steel, 1973; Vischer, 1989). Although not explicitly stated in these terms, the objective of these models is to obtain habitability. The objective of the models is to achieve the highest level of environmental quality.

For example, Cooper offers architects and designers site design guidelines for low-income housing (Cooper, 1975) (see Figure 6). Cooper convincingly argues with supporting theoretical and empirical evidence that the built form of the housing community influences the social aspect of the residents' lives. These guidelines include the basic needs of shelter, security, and also the need for comfort, convenience, socialization, self-expression, and with the culmination of the need for aesthetics (Figure 3).

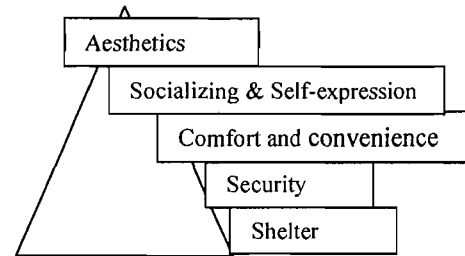


Figure 3 - Social Implications of Design
(Cooper, 1975)

Another needs-based model is Steele's 'Physical Settings and Organizational Development Dimensions' for work environments where the intent of these dimensions is to "capture major pieces of man's experience, yet are broad enough to result in a manageable number of categories" (Steele, 1973). Steele suggests that it might not be 'needs' that must be satisfied in order to obtain habitability, but 'dimensions' of the built environment that can enhance the P-E relationship. As per the transactional perspective of human needs, the terms 'need' and 'dimension' will be used interchangeably here. The dimensions include the need for shelter & security, social contact (does the setting promote or inhibit), symbolic identification (messages are sent about the setting), task instrumentality (help hinder tasks), and pleasure (does the setting provide pleasure). The ability of the physical environment to promote growth is at the top of hierarchy, where growth means the ability to promote developmental processes. Steele also emphasizes that that human needs are fluid and changing.

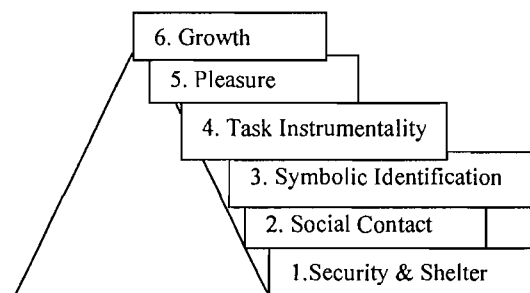


Figure 4 - Physical Settings and Organizational Development Dimensions (Steele, 1973)

A common element of each of these models is that shelter and security are always considered to be 'basic needs'. Even if human needs are considered to be fluid and changing, the basic need of shelter and security will not be considered one of these changing needs. Without protection from the elements, other needs are moot. By satisfying the need for shelter and security and moving beyond what Vischer calls 'the Habitability Threshold', only then can 'higher' environmental needs be achieved.

At this point, it is a fair question to ask, moving beyond basic needs for shelter and security, how do these models relate to one another? How can guidelines for a housing community relate to a work environment? The answer is that these needs-based models strive for excellence. Preiser and Vischer's habitability framework strive for high building quality, Cooper for aesthetics, and Steele for growth. At the pinnacle of these models is habitability.

Habitability will be described as at the pinnacle of the person-environment (P-E) experience. At this point, the environment enhances the P-E relationship and provides positive outcomes for the occupant. The goal here is to find these positive environmental dimensions.

It might not be obvious at first to examine the P-E relationship from a positive perspective. The relationship between people and the environment (P-E) is often viewed from a negative perspective, or from a health-reducing perspective (Burger, 1990; Kellert, 2005; Vining & Ebreo, 2002). Pollution, waste, world overpopulation, and global warming are examples of this negative P-E perspective. Although these are valid topics currently being addressed (Hawkins, Lovins & Lovins, 1999), it is not the intent here to view the P-E relationship through this negative lens. Let us consider these issues to be part of basic needs. Let us assume for example that the air is clean and that the water is drinkable. The search then becomes for aspects of the built environment that promote human health and well-being above and beyond basic needs. Let us seek all that is good in the P-E relationship. Let us look for health-enhancing aspects of the built environment.

The World Health Organization (WHO) defines health as: "the state of complete physical, mental and social well-being and not merely the absence of disease" (WHO, 1946) (Figure 5). With this definition, health is something more than a collection of negatives. It is an affirmative wholistic state. The term 'well-being' is introduced into the definition of health. The term 'well-being' will be used interchangeably with 'health' to denote this affirmative wholistic state.

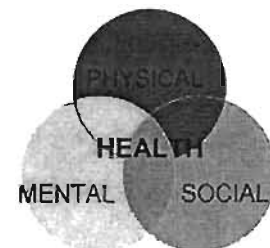


Figure 5 – World Health Organization (WHO) Definition of Health

With the addition of the word 'well-being', the ownership of the term 'health' by the field of medicine is somewhat reduced. A better understanding is required of what is meant by 'reducing the medical ownership of health' in order to better understand how the P-E relationship can be defined with the WHO definition of health. The next section will describe a 'demedicalized' health and how this definition of health relates to the built environment.

1.1 i) Habitability and Health

Centuries ago, health was perceived as a dialogue between Asclepius, the god of medicine and Hygieia, the goddess of health and the well-lived life. This exchange disappeared at the turn of the century with the success of the field of medicine in curing disease, alleviating pain and preventing death. The tendency towards positivist research methods further strengthened the power of Asclepius over Hygieia.

With the evolution of the role of the hospital, doctors in the medical profession became the "priests" of modern society with their knowledge granting them unquestionable power (Foucault, 1974; Illich, 1976). Illich argues that individuals no longer claim responsibility for their own health since it now belongs to the medical profession. Health and health care have become institutionalized with the consequence of the loss of the individual's right to self-diagnose. Illich claims the numbing of pain and the elimination of loss from the sensations of a now 'medicalized' society has had the unintended consequence of numbing joy as well (Illich, 1976). According to Illich, the only solution to the loss of the individual's control over their health is the 'demedicalization' of health, that is to say, to remove the medical aspect from health.

Today, the health care system is sometimes criticized for viewing health as a negative concept, so much so that it has been sardonically called the "sickness care system" (Evans & Stoddart, 1994). For example, In Canada the term *medical care* often refers to services of a physician, whereas *health care* refers to hospitals, dentists, drugs, etc. In the United States, *health care* and *medical care* are often used interchangeably. And in Sweden, the term *sjukvard* (*sickness care*) is used to represent these activities.

Many medical dictionaries define health as the absence of disease (Rootman & Raeburn, 1994). This definition trickles down to the lay-person who is interested in health only in its absence (Calnan, 1987). Fifty years ago the World Health Organization (WHO) rejected the definition of health as the lack of illness; defining health as "the state of complete physical, mental and social well-being and not merely the absence of disease" (WHO, 1946). This definition has been

criticized for being too vague and all-encompassing and therefore difficult to put into application (Evans & Stoddart, 1994). Quantifying degrees of health under this definition becomes problematic. There are no distinct boundaries between 'poor health' and 'good health'. It is understandable that the quantitative scientific approach would prefer to define health as a lack of disease.

However, there is growing concern in intellectual circles about the positivist 'scientific' approach to be able to exclusively define knowledge (McCloskey, 1989). Furthermore, it is becoming clear that the determinants of health cannot be explored adequately with these methods (Evans & Stoddart, 1994). For example, the strong empirical evidence now linking mortality (the number of deaths in a given period) to the lack of social support mechanisms is being paralleled to the link made in the 1950's between tobacco smoking to lung cancer (House et al., 1988). Questions are now being raised about the need to find a suitable framework to address these determinants of health. The dialogue between Asclepius and Hygieia has resumed. It is time for a good theory on the topic of health & well-being and its determinants – in this case, with the focus on the built environment as a determinant. The question becomes, how can a more wholistic interpretation of health be integrated into our P-E understanding of the built environment?

Let us first begin by stating that the built environment should support a *state of complete physical, mental and social well-being*. In other words, habitable environments should support health. Borrowing from Preiser's definition of habitability, 'health' will now be integrated into his definition. Habitability will now be defined here as follows: *Habitable environments include qualitative and quantitative aspects of the built environment which support human activities in terms of individual and communal goals, as well as supports human health. Habitability defines the degree of fit between individuals or groups and their environment, both natural and man-made, in terms of an ecologically sound, and humane built environment. Habitability supports individual physical, mental and social well-being.*

People spend up to 90% of their lives indoors, so it is worth-while to better understand the supportive effects of the built environment on people (Evans & McCoy, 1998; Ulrich, 2001). The objective of this thesis is to propose a framework describing environmental dimensions that lead to habitability. In order to achieve this objective, needs-based guidelines will be reviewed from Environment-Behaviour (E-B) and an integrative environmental framework will be proposed from the synthesis of these guidelines.

1.2) Objectives

There are three (3) objectives to this thesis:

- **Objective no. 1**

To propose an integrative environmental framework for health-enhancing environments based on a synthesis of research-based design (RBD) guidelines from a diverse user population.

- **Objective no. 2**

To investigate a proposed mechanism, here called the Individual Boundary Process (IBP), through which psychosocial dimensions in the proposed framework are regulated in the P-E relationship in order to maintain a health-enhancing environment.

- **Objective no. 3**

To test the proposed integrative framework empirically with parents and children in their homes. Of interest in particular are the 'higher' needs which include the need for social interaction and privacy, personalization and status, and the 'meaning of home'.

1.3) Questions

Two (2) questions are asked:

- **Question no.1**

Using the concept of 'habitability' (Preiser, 1987) and the World Health Organization's definition of health (WHO, 1947) to investigate research-based design (RBD) guidelines from the field of Environment–Behaviour (E-B), is it possible to establish a set of environmental dimensions for a health-enhancing environment?

- **Question no.2**

Is there a mechanism that binds these environmental dimensions together?

1.4) Method

1.4 i) Literature Review

The first objective will be achieved by presenting a literature review of research-based design (RBD) guidelines from diverse users and settings in Chapter 2. Following the synthesis of these RBD guidelines, an integrative framework for health-enhancing environments will be proposed in Chapter 3. This framework will be based loosely on Maslow's hierarchy of needs, where basic needs are described as *physiological* needs. Higher needs in the proposed framework are described as *psychosocial* needs.

For the past 30 years, the field of E-B has been developing RBD guidelines to address occupant needs (Devlin & Arneill, 2003). In this paper, RBD guidelines from four (4) settings will be reviewed to develop an integrative framework. The selection of these four settings is based on the author's participation with the Environmental Design Research Association (EDRA) from 2004 to 2007. Established in 1968, the mission of EDRA is "improving understanding of the interrelationships between people, their built and natural surroundings, and helping to create environments responsive to human needs" (EDRA, 2007). Although those attending the EDRA conferences respect this common mission, it was observed by the author at the three annual conferences that primarily four groups gathered at these conferences. Although the ages and needs of the occupants being studied in these groups are different, the author observed that different research methods and taxonomy were being developed to address what appeared to be quite similar questions. These four groups include i) hospitals; ii) Alzheimer care environments; iii) work environments; and iv) children's environments. This is by no means an exhaustive list of all environments studied in the field of E-B, but the author deemed this to be a good representation of some of the major sub-fields that had evolved over the past 30 years in E-B. In Robert Sommer's seminal work on the potential contribution of behavioural research to the design fields he reviews the hospital, school, tavern and college dormitory. He explains why he chose such a diverse selection of environments for his review: "the settings are selected for their differences rather than for any recurring theme" (Sommer, 1969). The settings that are presented in this thesis are also selected for their differences rather than their similarities in order to build a stronger case for common habitable dimensions across all environments.

True that it may still appear unwise to study such a wide range of age groups with such a wide variety of needs, however it will be argued that all persons, regardless of their age, personality, sickness and health level should be entitled to a habitable environment. It is acknowledged that

the RBD guidelines address needs of different users in different environments. It is true that a person's needs are not necessarily the same from one person to the next or from one setting to the next. For example, a person with Alzheimer's does not have the same needs as a child. But one also could argue that obtaining a humane built environment should be a governing tenet across all settings and all walks of life. Both the elderly and the child merit the highest level of comfort that the environment can provide.

In order to better understand what RBD guidelines are, it might be helpful to understand what RBD guidelines are NOT:

- They are not the opinions of *designers or architects*.
- They are not a sales pitch from *vendors and suppliers*.
- They are not the opinions of *researchers*.

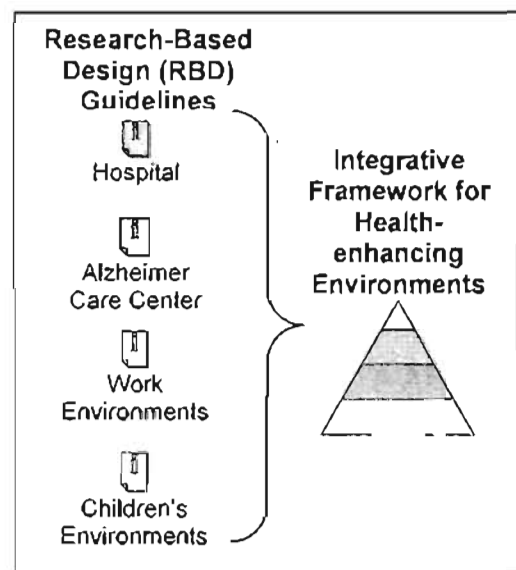
RBD guidelines are developed from data gathered from users or occupants of the built environment. The user or occupant can be an employee, client, cleaning staff, patient, visitor, some of these people or all of these people. RBD guidelines are concerned with the manner in which the occupants *use* (functionally), *perceive* (psychologically) and *judge* (evaluate) the physical environment.

1.4 ii) Theoretical Framework

There is concern that the field of E-B might be becoming too applied with the consequence of the lack of necessary reflection to conceptualize theories (Bonnes, Lee & Bonaiuto, 2003; Cooper Marcus & Sarkissian, 1986). The literature review presented in Chapter 2 of research-based design (RBD) guidelines will address the applied nature of the field.

Recall that the first objective of this paper is to establish environmental dimensions for habitability *for all people in all environments*. It is posited here that fundamental environmental dimensions exist in all habitable environments. The purpose of the review of the RBD guidelines in Chapter 2 is to find these fundamental needs. In Chapter 3, an integrative framework for habitability, or health-enhancing environments, will be proposed (Figure 6).

Figure 6 - Integrative Framework for Health Enhancing Environments



As explained in Section 1.1 the Problem Statement, satisfying human needs is integral to achieving habitability. Therefore, a needs-based model will be proposed for the framework. One such needs-based model not specifically addressing the person-*environment* relationship is Maslow's hierarchy of needs. Since the framework being sought is not particular to any one environment or group, then this generalized quality is a suitable model to base the review of the RBD guidelines. A comparison of the terms used in Maslow's hierarchy of needs with the terms from the field of E-B is proposed (see Table 1).

Table 1 - Comparison of Maslow and Environment - Behaviour (E-B) Terminology

<u>Maslow's Terms</u>	<u>Proposed E-B Terms</u>
<i>Basic Needs:</i>	<i>Physiological Needs:</i>
- Shelter	- Shelter
- Health & Safety	- Safety & Security
<i>Psychological Needs:</i>	<i>Psychosocial Needs:</i>
- Belonging	- Sense of community; Ownership; Territoriality
- Self-esteem	- Status; Personalization; Privacy
- Self-actualization	- Habitability

The second objective of this thesis is addressed by proposing a mechanism through which habitability is achieved. A process through which a person regulates the psychosocial dimensions in the framework is proposed in Chapter 4. This proposed mechanism is called here the Individual Boundary Process (IBP).

1.4 iii) Testing the Framework

In order to achieve the third objective which is to test empirically the 'higher' needs on the framework, 17 parents and 27 children are interviewed in 17 Montreal family homes. As explained previously, this integrative framework applies to all people in all settings. Therefore, the choice to investigate parents and children in their home environment was simply due to the convenience of the sample for the researcher who has school aged children and works from home. Field testing of the framework could have been done in any setting.

The measurement instruments used in the field work are based on tested and validated tools from a recent study on housing quality and mental health in the United States (Evans, Wells, Chan, & Salzman, 2000). The three tools are: the Housing Quality Index, the Children's Behaviour

Questionnaire, and the PERI Mood Self-assessment (Evans et al., 2000). Some questions were added by the author as well to better understand the 'higher' needs.

The Housing Quality Index was tested further in a study on the relationship between housing quality and children's socioemotional health (Evans, Salzman, & Cooperman., 2001). This instrument incorporates observations of structural quality, privacy, indoor climate, hazards, cleanliness/clutter, and children's resources. The results of the 2001 study call for an investigation into 'potential underlying mechanisms to help explain the relations between housing quality and children's well-being' (Evans et al, 2001). This study was then duplicated in Canada (Gifford, 2003). One of the conclusions in the Canadian study draws emphasis to the importance of the balance between desired states of isolation and of social interaction and how these desired states related to children's socioemotional health.

The Housing Quality Index in the US and Canadian studies tends to focus on the physical qualities of the home, such as assessing surface damage, amount of paint peeling on the walls and ceiling, exposed wiring, etc. The purpose of the empirical study here as described in objective no.3 is to examine the psychosocial dimensions of the proposed framework. Items in the checklist were therefore added by the author to better understand how E-B higher needs, as described in Table 1, relate to occupant well-being, such as the regulation of privacy and social interaction, the need to personalize, and 'the meaning of home'.

A section to be completed by the parent was added by the author asking the questions: "Is there a place for your child to be alone in the home?" and "What do family members think of this retreat space?" Although a measurement of the degree of clutter is included in the Housing Quality Index, other questions were added by the author about personalization such as: "Is the child's artwork on display?" "Does the child have a place to store his/her 'treasures'?" The parent was asked: "where in the home do you feel most at 'home'?"

The author also added a short interview with the children in order to better understand the child's use and perception of their home. Questions were asked about the child's sense of ownership of the home "Whose home is this?" (1- Other people's home (ie. landlord), 3- my parents, 5- mine), how they regulate their need for privacy and social interaction "Do you have favourite place? Where is your favourite place?", as well as how the child feels about their home "Is there anything about your home that makes it special, different or better than other people's homes?"

The two measurement instruments from the US and Canadian studies were used here to assess the parent and the child's health (Evans et al., 2000). The first instrument is the Children's Behavior Questionnaire which is a reliable and valid index in which the parent gauges the child's behavior on a 5 point scale (Rutte, Tizzard, & Whitmore, 1970). The second measurement instrument is the Demoralization Index of the Psychiatric Epidemiology Research Instrument (PERI) (Dohrenwend, Shrout, Egri, & Mendelsohn, 1980). The author added the parent's self-assessment of their own as well as their child's health, by asking the questions: "How would you rate your child's physical health?" (1-not healthy; 5-very healthy) and "How would you rate your own physical health?" (1-not healthy; 5-very healthy).

With these tested and validated instruments as well as questions added by the author, a qualitative analysis of the data is presented in Chapter 5 (Denzin & Lincoln, 2005). The discussion of the results is presented in Chapter 6 and the conclusions and areas for future research are presented in Chapter 7.

I.5) Summary: Outline of this Thesis

There is a risk of the E-B field becoming too applied with the consequence of a lack of necessary reflection to conceptualize theories (Bonnes, Lee & Bonaiuto, 2003; Cooper Marcus & Sarkissian, 1986). There has not yet been a review of the cumulative work of RBD guidelines with the objective of finding common elements of environments with a high degree of habitability. An integrative framework for health-enhancing environments will be developed from the assimilation of this E-B knowledge.

In the next chapter, a synthesis of research-based design (RBD) guidelines is presented. Recurring environmental needs from this synthesis are discussed and an integrative framework for health-enhancing environments is proposed in Chapter 3. In Chapter 4, from the field work presented later in Chapter 5, a process in which a person regulates their personal boundaries is then proposed. This process will be called the Individual Boundary Process (IBP). In order to test the psychosocial dimensions of the integrative framework, an empirical study performed in 17 Montreal family homes on 17 parents and 27 children is presented in Chapter 6. The results of this field work are discussed in Chapter 6 and the conclusions are presented in Chapter 7.

The work presented here will address the need to further theoretical knowledge in the field of Environment – Behaviour. Hopefully this work will help address the 'subtle environmental crisis' as mentioned by Steele (1973) in the opening citation of this chapter. The contribution will be a better understanding of the dimensions that lead to habitability. With this knowledge, occupants will be less inclined to accept environments that are 'unhelpful or detrimental to what they are trying to do', and professionals working in the building industry will have a new toolkit to help them build more habitable environments.

CHAPTER 2

CHAPTER 2 – REVIEW OF RESEARCH-BASED DESIGN (RBD) GUIDELINES 19

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Chapter 2 – Review of Research-Based Design (RBD) Guidelines

In this chapter, research-based design (RBD) guidelines from different settings are examined with the objective of highlighting major elements that produce a health-enhancing environment. The terms 'supportive', 'health-enhancing' and 'habitable' will be used interchangeably. Research-based design (RBD) guidelines from four environmental settings will be reviewed in this chapter. They include 1) Hospitals; 2) Alzheimer care environments; 3) Children's environments, and 4) Work environments.

Let us begin with the first environmental setting, the hospital.

2.1) Hospital Environments

In spite of the major stress caused by illness and traumatizing hospital experiences, comparatively little emphasis has been given to creating surroundings that calm patients, strengthen their coping resources, or otherwise address psychological and social needs.

Roger S. Ulrich, 2001, (p.49)

The hospital environment, simply due to its *raison d'être*, is a stressful environment. The visit to the hospital is often because of an injury, illness or health problem. The situation is stressful for the patients. The families of the patients are often stressed. Furthermore, the care providers can be stressed as well. How can the hospital environment help to ease the stress of this experience?

In a hospital, satisfying the basic needs for health and safety is a necessity. The physical environment must not threaten the patient's (or anyone's) health and safety. The health of a patient arriving in a healthcare setting is already compromised. It therefore becomes elemental that the environment support healing and not act as yet another stressor. Furthermore, the patients are not the only occupants of the hospital. The well-being of nurses, doctors and staff must also be considered for them to provide effective care.

Ventilation

Some of the basic health needs include the need to reduce risk of infection. Superior ventilation systems are essential in hospital environments to eliminate the possibility of

airborne infections. Infection rates can become problematic if a ventilation system is not maintained in a hospital. Single bedrooms have been shown to reduce the spread of infection in patients for bone marrow transfer patients and burn victims (Pasweg et al, 1998; McManus et al, 1994). Hand washing facilities must be easily accessible as well. Environmental design can also reduce the number of falls, which is a significant concern in the care environment. The number of patient falls can be influenced by various design parameters such as carpeting; bed design; designing for better visibility of patients from the nurse's station; design of family space in the room to assist the patient get out of bed. Environmental design can reduce medical errors as well by providing for adequate lighting, ergonomic workspaces and reducing noise distractions (Booker & Roseman, 1995; Flynn et al., 1999).

Noise

Noise can effect patient health outcomes. Exposure to noise has been shown to increase blood pressure and heart rate (Morrison et al.'s study in Ulrich et al. 2004). Noise levels in hospitals are often higher than recommended levels (Allaouchiche et al., in Ulrich et al. 2004). High noise levels can cause physiological damage to a person's hearing. But annoyance or psychological effects of noise, not necessarily in the high decibel level, is also detrimental. The psychological effects can influence health outcomes of patients as well as productivity of staff. Too much noise from alarms, paging systems, trolleys, ice machines, staff voices, telephones, televisions, and roommate voices can reduce the quality of the patient's hospital experience. Furthermore, hospital surfaces are generally hard which cause sound to reflect, overlap, linger and reverberate. Single bedrooms can lower noise disturbances for a patient. Perhaps the most significant consequence of all this noise is the impact on the quality of sleep for the patients. If a primary objective is healing in a hospital environment, then shouldn't quality of sleep be assured?

Natural light, Nature & Views

Natural light has been demonstrated to have a curative effect on patient outcomes. Patients in the rooms on the sunlit side of the building took less pain medication (Walch et al.'s study in Ulrich et al., 2004). Exposure to bright light can improve circadian rhythms and sleep (Van Someren et al's study in Ulrich et al., 2004). Views and artwork of nature scenes, as opposed to abstract art, improve health outcomes as well (Ulrich, 1984; Carpman & Grant, 1993). Positive distractions such as music, technology, play and mother's voice, as well as sensory stimuli such as sound, light, humidity, temperature and colour have been shown to be

beneficial for hospital environments for children and their families (Shipley, 2001). Gardens and access to nature reduce anxiety and stress as well (Cooper Marcus & Barnes, 1999).

Wayfinding

Proper wayfinding is a tool which can reduce the stress of the hospital experience. Not only can wayfinding problems be expensive (work time lost by staff constantly directing visitors or getting lost themselves), disorientation can lead to feelings of anger, hostility, discomfort, indignation, and even panic. When implemented properly, a good wayfinding system will integrate clear and understandable signage, logical room numbering, visible cues, and a legible physical arrangement (Carpman and Grant, 1993).

Social Places

The hospital environment must provide places for visiting families, children and friends in order to make visitors feel welcome at the hospital, for example by including sleeping facilities, storage areas, eating areas, comfortable lounges and waiting areas (Carpman & Grant, 1993; Shepley, 2001). Some evidence indicates that single rooms support and accommodate the presence of family and friends better than shared rooms (Chaudhury, Mahmood, & Valente's study in Ulrich et al. (2004). Patients who stay in single rooms, compared to those with a roommate, appear more satisfied with "accommodations and comfort for family and visitors." (Press Ganey's study as cited in Ulrich et al., 2004). However, another study indicates that, if costs were no object, 45% of the patients would choose a private room; 48% would choose a semiprivate room; and 7% would prefer a multiple-bed room (Carpman & Grant, 1993). Another review confirms that patients' opinions are divided on the issue of privacy and socialization in a shared room (Malcolm, 2005). At the hospital, the physical environment must allow the person to regulate the amount of social contact (Carpman & Grant, 1993). Too little as well as too much social interaction is not beneficial. Even infants respond adversely to intense social interaction (Shepley, 2001).

Good communication between patients and hospital staff has been shown to reduce anxiety, promote better care at home after discharge and positive health outcomes (Press Ganey's study as cited in Ulrich et al., 2004). Private rooms can be seen as facilitators for communication between doctors and patients since patients who share a room can be hesitant to disclose information for fear of being overheard.

Privacy

Confidentiality and privacy are important considerations in the hospital setting. Doctors and nurses can unintentionally breach patient confidentiality and privacy when they are overheard. Studies indicate that patients will withhold medical information or refuse a physical examination when they are afraid of being overheard or seen (Barlas et al. 2001). Therefore, the inability of the physical environment to provide privacy can affect the quality of care.

Choice

Finally, patient-centered care considers that by providing *choice* to the patient, this will assist with the healing environment. The Planetree model is a patient-centered care program of which one of the objectives includes creating a homelike environment for the patient, as well as ensuring that the patient has access to information and that the nurses are satisfied with the care environment (Martin, Hunt, & Conrad's study as cited in Devlin & Arneil, 2003).

In conclusion, perhaps a thought about the infamous hospital gown is appropriate. What message do these gowns send from hospital management to the patient? One could infer: 'your basic needs are being tended to (*physical health*), but we don't care if you feel vulnerable and not respected (*belonging and self-esteem needs*)'. Providing a total health experience in a hospital setting involves providing for all the needs in Maslow's hierarchy, which include, along with basic need of health, the need to belong and to nurture self-esteem. The patient's total health must be addressed. As per the World Health Organization's definition, this includes physical, mental and social health. The physical environment has been shown to influence many of these needs in the hospital environment.

The next section reviews RBD guidelines from Alzheimer Care Environment Environment-Behaviour research.

Figure 7 - Hospital Gown (by Mike Baldwin)



2.2) Alzheimer Care Environments

I was out of energy, out of patience... and I was afraid I was out of love, because I was starting to scream at him ... and he hit me one time. Every day he is slowly dying and part of me is dying with him, and our marriage is dying with him... I am not widowed, not married.... What am I?
(wife-caregiver)

N. Gnaedinger (1989)
cited in Cohen & Weisman, 1991, (p.17)

The care of persons with dementia requires a balance between aspects of home and institutional care. Many persons with this ailment desire to remain in their home, and often family members are in agreement (Cohen & Weisman, 1991). But the progression of the disease is such that the demands eventually become too much for the family and the person with dementia is then sent to a care center.

In 1975, M. Powel Lawton proposed needs-based design guidelines for the elderly. In these guidelines, Lawton suggests that the physical environment should afford safety, negotiability, orientation, autonomy, personalization, social integration, and esthetic considerations (Lawton, 1975). Since then, research efforts have established a positive relationship between the physical environment and health and behavioural outcomes for persons with dementia (Calkins, 1988, Cohen & Weisman, 1991, Zeisel et al., 2003). Increasing numbers of care centers are using RBD guidelines to improve resident, family members' and care givers' experiences in these environments.

A review of the literature on people with dementia revealed the importance of ensuring safety, security, familiarity, and social contact (Rand et al. 1987). Calkins defines a set of "environment and behavior issues" that can assist with treatment. These include addressing safety and security, wayfinding, personalization, privacy and socialization and competence in daily living activities (Calkins, 1988). Residential character or 'home-like' appearance (as opposed to sterile industrial interiors) is associated with greater independence, reduced social withdrawal, more family visits and improved sleep and that privacy reduces aggression, agitation and improves sleep (Minde, Haynes, & Rodenburg's study in Zeisel et al, 2003). Privacy means the ability for the person to withdraw themselves socially from the group.

Cohen & Weisman define a *therapeutic environment* as an integrated system of social, organizational and physical environment elements (Cohen & Weisman, 1991). The authors

propose nine therapeutic goals to assist architects or designers as well as policy/ program planners to understand how the physical environment can act as a 'therapeutic intervention':

1. Ensure safety & security.
2. Support functional ability through meaningful activity
3. Maximize awareness and orientation
4. Provide opportunities for stimulation and change
5. Maximize autonomy and control
6. Adapt to changing needs
7. Establish links to the healthy and the familiar
8. Provide for opportunities for socialization
9. Protect the need for privacy.

More recently, Zeisel proposed a set of environmental factors which can improve behaviour outcomes of person's with Alzheimer's (Zeisel, 2005). Because of the decrease in brain functioning caused by this disease, it is emphasized that the physical environment should not hinder daily activities. Environmental cues should support the cognitive functioning of these persons. Some of these environmental-behaviour (E-B) concepts highlighted by Zeisel include:

1. Environments in which all the information needed to find ones way around is embedded in the setting.
2. Environments that are totally protected, with exit doors that are made less evident and with blocked views of what is beyond the enclosure.
3. Personal environments that provide residents with autobiographical cues of their past.
4. Rooms and gardens that evoke different and strong moods and emotions.
5. Significant places that focus on hard-wired memories such as food, warm, social support, and nature.
6. environments that are prosthetic in that they naturally make up for losses in mobility and limb strength, and are safe yet not evidently institutional.
7. Environmental messages and cues in non-verbal form.
8. Environments that provide contact with nature, weather, time of day, and plants – natural cues to the passage of time.

The results of an investigation of the relationship of behavioural and health outcomes and E-B concepts revealed correlations between environmental factors (Zeisel et al. 2003). The study showed two environmental factors to be most significant: 1) the degree of privatization, and 2)

common spaces that vary in ambiance. By allowing the residents more privacy, they experienced less anxiety and aggression. As the variability of common spaces was increased, the degree of social withdrawal, depression, misidentification and hallucinations decreased.

The next section reviews RBD in children's environments.

2.3) Children's Environments

"I became acutely aware that what a child wanted to do most of all was to make a world in which to find a place to discover a self."

Edith Cobb, cited in Moore, 1986

Assuming that the child has adequate shelter, the next need is safety. A recent UK study illustrated that the majority of accidents for the population are in the home, not in the car or at work (Moore & Ormandy, 2004). Young children and elderly people are more at risk, not only because of their physical and developmental limitations, but also because they are in the home for longer periods of time.

Visual & Voice Contact

Parents need to maintain visual and voice contact with their children in order for both parties to feel safe (Hart, 1979). Another study includes 254 design guidelines for exterior spaces, approximately 61 (24%) of these guidelines touch upon the importance of addressing needs of children, such as ensuring: safety from cars; adequate traffic management; pedestrian precinct; woonerfs (combined pedestrian & traffic zones); hazard free play; doorstep play, balcony play and 'playing everywhere' (Cooper Marcus & Sarkissian, 1986).

'Play Everywhere'

Children's environments must allow play opportunities to ensure healthy developmental growth. The concept of providing for 'play everywhere' is important when designing places for children. Moore (1986) describes play for children as important for healthy developmental growth. Play includes discovering our environment; developing a sense of mastery and control of our environment; using the imagination and creating; expressing ourselves; and experiencing joy and delight (Ferland, 2002). The importance of manipulating the physical environment is emphasized including the need for children to have access to a natural environment (Hart, 1976; Cooper Marcus & Sarkissian, 1986).

Many more spaces could be interpreted as play opportunities for children, and not simply their bedroom or the basement playroom. For example, play can be incorporated into the family and living areas, the kitchen and hallways of the home (Prescott, 1987). Furthermore, these play opportunities should include the ability for the child to build, to take apart and to manipulate the environment. Through this creative exploration of objects, a child develops 'environmental competence' which is "the knowledge, skill and confidence to use the environment to carry out one's own goals and to enrich one's experience" (Hart, 1976, p.410). Hart also explains that children appear to enjoy the voyage and are often not so interested in the destination. Often, there is no 'there'; the children are just exploring. The necessity to provide for exploration is emphasized as well (Trancik & Evans, 1995).

Identity

David & Weinstein comment that "there has been a neglect of physical variables in mainstream child development research that reveals a tacit view of the physical setting as an unimportant backdrop" (David & Weinstein, 1987). They emphasize that "all built environments for children should serve certain *common functions* with respect to children's development: *to foster personal identity; to encourage the development of competence; to provide opportunities for growth; to promote a sense of security and trust; and to allow both social interaction and privacy; ... foster personal identify*" (italics David & Weinstein). They use the example of a two-year-old who has learned the word 'mine' to highlight the fact that possessions and places are crucial elements in the development of personal identity for young children. The important of personalization of living spaces is also stressed in order to foster the development of competence.

Social Places

Healthy children's spaces include places for socialization. "Children need easy, casual access to other children without a formal invitation to play; children need places in the communal environment that are undeniably their territories where they can expect to find other children" (Cooper Marcus & Sarkissian, 1986). The recommendation is to design features into the physical environment to provide for children's social needs. Prescott also emphasizes the importance of providing for social interaction for children in the home (Prescott, 1987). Even beyond the home and into the design of housing clusters, it is stressed that designers should

provide for 'casual interactions' and 'friendly encounters' which then lead to a sense of community and identity (Cooper Marcus and Sarkissian, 1986).

Privacy

Once socialization needs are addressed, one must consider the ability to *regulate* social interaction. The "selective control of access to the self or to one's group" is the definition of *privacy* (Altman, 1975). Many conceptual environmental frameworks for children emphasize the need to provide privacy (Evans, 2002; Gifford, 2003). Children require (age-appropriate) freedom to control their interaction with others. The environment must be designed to allow for this need for the healthy development of children. In a study of children's perception of privacy, the importance of *choice of* aloneness or interaction is emphasized as an important part of a child's healthy development (Maxine Wolfe, 1978).

Gifford (2003) has empirically demonstrated the relationship between housing quality and children's socio-emotional health. In the study, the instruments to collect data include a Children's Behavioural Problem Inventory, a Parent's Feelings Scale self-assessment (nervous, happy, downhearted, etc.), and an extensive Residential Checklist consisting of 245 physical features performed by a trained researcher in each of the 95 Canadian children's homes. One housing item that correlates significantly more than any other housing item to the child's socio-emotional health is "bathroom door not closable". This empirical result suggests that the need for privacy plays a significant role in the healthy development of a child.

The next and final section reviews RBD guidelines in the work environment.

2.4) Work Environments

a 'quality' work environment is not just ergonomic seating and good task lighting, not just individual temp and ventilation controls, and not (most certainly) just new furniture and a flashy design...[they are] 'people-places' rather than 'object-places' [and] are most likely to provide high-quality experiences for their users.

Franklin Becker & Fritz Steele, 1994

The concern for safety and security in the industrial setting in the Western world has improved significantly since the Industrial Revolution. It is undisputed today that exposure to dangerous chemical, biological and radioactive substances, repetitive physical tasks, poor ergonomics and dangerously high noise levels are health risks as well as create losses in production. Poor occupational health is related to physical and mental illness and accidents (Huovalta, 2004). There is little debate today as to the importance of health and safety issues related to the industrial work environment. However, the knowledge-workers' environmental needs appear to be less clear.



Figure 8 - Another Day in Cubicle Paradise
(by Scott Adams)

The Office Building

In the 1970's, the office building came under scrutiny as a potential threat to health. In 1976, contamination of water in the ventilation system in a hotel at an American Legion convention in Philadelphia led to the first known major outbreak of "Legionnaires' disease." In the 1980's, buildings became increasingly air-tight and the exchange of fresh air was reduced in the quest for energy-efficiency consequently causing a form of 'sick building syndrome'.

Beyond air quality, other aspects of the office environment can threaten an office workers' health. Some examples of these aspects can include repetitive tasks that can cause back injuries and carpal tunnel syndrome; computer screens and glare can cause eye-strain and headaches; and fluctuating temperatures and air drafts can create discomfort. Although injuries and discomforts are less sensational than heavy industry, knowledge worker's environment-related 'injuries' nevertheless cause productivity losses. These basic concerns should be addressed for the employees to be healthy and productive.

Steele (1973) explained that there was more to understanding the beneficial effects of the physical work environment than the convenience of the dimensions of a closet to store a coat. Steele categorized six dimensions of the work environment that capture the essence of "man's

experience". These dimensions are: 1) Security & shelter; 2) Social contact; 3) Symbolic identification; 4) Task instrumentality; 5) Pleasure, and 6) Growth.

Organizational Ecology

Organizational ecology is the harmonious relationship between the office environment, management and the employees (Becker & Steele, 1994). In organizational ecology, the office environment is seen as a tool to assist the workers in their tasks. The office environment can enhance the productivity of knowledge-workers by first providing for safety & security, addressing air quality, sound, light and temperature measurements, and proper ergonomics. Furthermore, the need to satisfy personal comfort, personal control, provide natural light and ease "life's logistical stress" (provide daycare, physical fitness centers, etc.) will improve work-related outcomes. Steele (1994) addresses the need to rethink the importance of space, identity and status in the office environment. The office environment, according to Steele, can provide more than simply shelter – it can enhance the work experience improving the mental health and well-being of the organization as well as of the employee.

Consequences of High Quality Work Environments

Similar to Becker & Steele, Vischer (1996) emphasizes that the work environment should be seen as something that can contribute positively to work and not as merely as a cost. Vischer emphasizes that the work environment can be seen as a tool which can be used to improve productivity, morale and health in the workplace. Vischer uses a diagnostic tool to assess the quality of the work environment based on the occupant's perception of their environment. This tool is called the Buildings In Use (BIU) assessment and consists of twelve dimensions which determine environmental quality (Vischer et al., 2004): These dimensions are: 1) Safety; 2) Workstation comfort; 3) Thermal comfort; 4) Acoustic comfort; 5) Visual comfort; 6) Computer comfort; 7) Air quality; 8) Lighting quality ; 9) Day lighting; 10) Privacy; 11) Team space, and 12) Cleaning. Questionnaires are completed by occupants of the workspace and results are compared against a database of survey results. Problems with the work environment are then diagnosed and can consequently be addressed.

The architectural research firm, BOSTI, support the need for privacy and comfort. Their empirical findings from 13,000 responses to a questionnaire survey revealed that the ability to do distraction-free solo work and the need for support for impromptu interactions were ranked as the two highest needs for high quality workplaces (Brill et al., 2001).

Vischer describes the relationship between the organization and the physical environment as the organization-accommodation (O-A) relationship. In this context, the work environment is viewed as a tool to assist, and not hinder, the employees to perform their work tasks effectively. It is an interactive approach between occupants of the building, management and the physical environment.

Leaman has a similar building assessment tool, called the Building Use Studies Occupant Survey Method which also consists of a questionnaire for the occupants of the building (Leaman, 2003). The questionnaire has over 40 self-assessment questions involving comfort, health, satisfaction, design quality, etc. A database of several thousand occupants in over 200 buildings is used as a benchmark for environmental quality. This analysis of health, comfort and productivity is linked with technical and energy performance studies, or post occupancy evaluations.

Post Occupancy Evaluation (POE) is a process used to assess the performance of a building in terms of how well it addresses the needs of occupants (Preiser, 1989). Ideally, feedback from the building evaluation occurs throughout the building delivery process. Preiser emphasizes that the process is not linear, with an end product in mind (such as a completed and occupied building), but "is seen as a cyclic evolution which has as its goal the continuous improvement of the quality of buildings". Recently, Building Performance Evaluations (BPE) extends the POE method to incorporate the planning and construction stages of design and is used not only once a building is complete and occupied (Preiser & Vischer, 2005). The goal of the BPE is to ensure building quality for the end-user during the decision-making process throughout stages of building from strategic planning, programming, design, construction, occupancy to facility management, and adaptive reuse/recycling.

These examples of assessment tools of the work environment emphasize the consequences of a high quality work environment such as improved satisfaction, health & well-being, better employee retention, and the possibility of improved productivity and efficiency.

2.5) Summary: Lessons Learned from RBD guidelines

In this chapter, a summary of RBD guidelines from four different settings were presented. Some of the environmental dimensions highlighted in these RBD guidelines include:

- In the hospital setting some recurring themes are: the need for superior ventilation, lower noise levels, views, daylight, places for families; and places for privacy.
- Alzheimer environments act as a 'therapeutic intervention' when interior character is residential rather than institutional; they provide for paths, access to nature, private places as well as varied social areas.
- Allowing for play in as many places as possible is a need repeatedly emphasized in children's RBD guidelines. The need to provide for places for social encounters as well as to respect the child's desire for private places is a recurring theme. The important role of control over the physical environment as a catalyst to a child's healthy development of the self is also emphasized.
- And lastly, RBD guidelines for work environments emphasize the need for the physical environment to support work, rather than hinder the process. Impromptu social contact becomes more important, access to natural light, acoustic and visual privacy are aspects that must be considered when creating habitable work environments.

In this next chapter, Maslow's hierarchy of needs will be used to describe recurring themes that figure in this E-B work. The result of this investigation will be a proposed integrative framework for health-enhancing environments.

CHAPTER 3

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Chapter 3 – Toward a Supportive Environmental Framework

“...the environment is primarily a means to the person’s self-actualizing ends.”
Abraham Maslow, 1954/1987, (p.39)

Maslow believed that human beings to be motivated by good (Maslow, 1954). He differentiated between *deficiency motivation* (stimulated by the lack of a need at the most basic level) and *growth motivation* (when searching for a new experience). Research in mental health and in the psychology of need satisfaction has been criticized as slow to catch up with Maslow’s distinction between deficiency reduction and growth promotion (Lawton, 2001). Therefore, with the mindset that the environment might offer possibility for growth promotion, Maslow’s model of human needs will be used here to analyze environmental needs for supportive environments.

In the following sections, recurring environmental dimensions from the RBD guideline reviewed from the previous chapter are described and discussed.

3.1) Physical Health

3.1 i) Safety & Security Needs

Beyond the Habitability Threshold, once the basic need for *shelter* has been provided, the subsequent need is for *safety & security*. The term *safety & security* will be preferred over Maslow’s term of *health & safety* since ‘health’ is ubiquitous in this framework. Security is not only related to physical health, but to a person’s mental well-being as well (Newman, 1976). Recall that health includes physical, mental and social well-being.

The concern for the safety & security of children in relation to the physical environment is often of high priority. Policy makers inform parents and caregivers of hazards, such as the need to relocate dangerous cleaning products out of reach of young children, the need for fire detectors in the home, the risk of electrocution, the risk of lead and asbestos, the risk of burns and of falls, etc. Alzheimer care centers, hospitals, and other environments must address safety & security concerns as well, but the risks are not the same. Wandering can present significant safety risks for persons with dementia. Different characteristics of building occupants mean that the physical environment must be addressed differently to ensure occupant safety & security.

3.1 ii) Daylight & Nature

“Go play outside!” Many of us can remember our mothers telling us to go outside. Was this to allow the children to release their energy in a boundless place? Was it for us to discover the natural world? Was it for the Vitamin D from the sun? Or was it just to give our mothers a break? Regardless of the reason, there is a restorative aspect to the outdoors (Kaplan, 1995). As indicated in the review of the RBD guidelines, both nature and daylight appear to have beneficial effects for all occupants.

As shown in the previous chapter, RBD guidelines for children’s environments stress the importance of having access to the outdoors. Work environments indicate exposure to natural light as beneficial. The importance of daylight as a medium for enhancing healing is highlighted in hospital environments. Alzheimer care centers require outdoor activities and gardens. Could access to daylight be an important side-effect to gardening?

Hospital RBD guidelines emphasize the curative properties of therapeutic gardens. Pictures of tranquil nature scenes and rooms with views help to reduce hospitalization stays and medication intake. Alzheimer care centers stress the importance of access to therapeutic gardens as components that reduce elopement and improve sleep. There is a restorative effect associated with natural spaces as well. People often choose a natural setting when they need to get away and reflect (Cooper Marcus, 1978). And finally, people have a preference to ground-level entrances for their homes (Cooper Marcus & Sarkissian, 1986).

Both the need for daylight and access to nature for the building occupant appears throughout the RBD guidelines reviewed here. These needs are repeatedly mentioned and should therefore be considered as an integral part to a supportive environment. With this knowledge, one might then begin to question some building paradigms that appear in our North American lives such as the high rise apartment building tower with symmetrically stacked balconies. These balconies are often no larger than a closet. Do these concrete and steel spaces satisfy the need for access to nature? How do these 4x8’ balconies stacked one on top of the other provide the natural light required for habitability? It is building paradigms like this that should be questioned if we are aiming for habitability.

3.2) Psychosocial Health

Once the basic needs of building occupants have been addressed, the next level of needs according to Maslow is the need for belonging. The built environment can provide places for people to meet and congregate. It can invite and encourage bringing people together and not hinder this process. Review of RBD guidelines in this paper reveals that health-enhancing environments encourage *social relationships and interaction*.

3.2 i) Social Interaction

...social interaction is the continuing interplay or dialectic between forces driving people to come together and to move apart. There are times when people want to be alone and out of contact with others and there are times when others are sought out, to be heard and to hear, to talk and to listen.

Irwin Altman, 1975, (p.22)

RBD guidelines stress the need for the built environment to allow people to physically come together and encourage positive social interaction. For example, the need for social interaction is prevalent in RBD for hospitals where the need for families to be involved in the care process is emphasized. In Carpman & Grant (1993), a recurring subject in each chapter is the need to provide place for families and friends in hospitals. In Press Ganey's 2003 hospital satisfaction survey, the need to provide accommodations and comfort for visitors is ranked 9 out of 48 items (not necessarily associated with the physical environment) which affect satisfaction with their hospital stay (Ulrich et al., 2004). Cohen & Weisman (1991) and Zeisel et al. (2003) indicate the need for opportunities for social interaction and common space to improve behavioural outcomes of persons with Alzheimer's disease. Cooper Marcus & Sarkissian stress the importance of designing communities which provide for 'friendly encounters' and 'casual meetings' (Cooper Marcus & Sarkissian, 1986). Children need places where they can meet friends and play, all the while within earshot and visibility of the parent. Office environments stress the importance of providing for official meetings, for impromptu meetings, and for teamworking rooms.

It is widely recognized that social relations and affiliations have powerful effects on both physical health and mental well-being (Berkman & Syme, 1979; Berkman, 1995). One of the founders of modern sociology, Emile Durkheim (1897) established that an individual's physiological health was related to their social dynamics patterns. He demonstrated in his book '*Suicide*' that mortality rate was related to the degree of social integration (Durkheim, 1897). Since then, House and his colleagues' work on the importance of social support as

related to health outcomes has demonstrated quite strongly that a lack of social support might be as significant of health risk factor to coronary heart disease mortality as smoking (House et al., 1988). The need for social support has been shown to be an important contributor to workplace health as well (Karasek & Theorell, 1990). Design of the built environment can assist in these positive social processes. It is imperative to understand this link between health and social interaction and translate this into the built form. The designer has the ability to ensure that building occupants have places for such encounters. Health-enhancing environments must provide these places.

Change rather than stability characterizes the person. The person needs to regulate their amount of social interaction. Therefore, a health-enhancing environment must offer the individual the ability to choose degrees of social interaction – that is to say, the person will also require privacy.

3.2 ii) Privacy

“It is clear from Calhoun’s experiments that even the rat, hardy as he is, cannot tolerate disorder and that, like man, he needs some time to be alone.”

Edward T. Hall (1966) p.29

In the same breath as the importance for the built environment to provide for social interaction is revealed in these RBD guidelines, so too is the importance of providing for privacy mentioned. The individual’s need for a private place appears repeatedly throughout the RBD guidelines reviewed.

Privacy is defined as “the selective control of access to the self or to one’s group” (Altman, 1975). Westin (1970) describes four types of privacy:

1. solitude – to be alone and free from observation by others;
2. intimacy – when a small group such as a husband and wife want to be alone and get away from a group;
3. anonymity - “lost in a crowd”;
4. reserve – the ability to “tune out”, for example even when a person is talking face-to-face, one can choose not to listen to the other person.

Review of RBD guidelines emphasizes that children need hiding places, places where they can get away from the group, and restorative places. These places assist in a child’s healthy developmental growth. In Gifford’s study on housing quality and children’s socio-emotional health, the correlation between “bathroom doors not closable” and the children’s

socio-emotional health is not trivial (Gifford, 2003). This correlation is significantly higher than all other 242 housing items in the study. These results suggest that the importance of privacy for children should be investigated further.

RBD guidelines for designing places for persons with Alzheimer's and their families also stress the importance of protecting the needs of privacy and providing for individual space. Zeisel et al. (2003) empirically demonstrate that allowing more privacy results in less anxiety and depression in residents. The hospital environment stresses health benefits associated with providing privacy for the patient. Ulrich et al. (2004) promote single rooms to improve patient healing in hospitals. However, conflicting results regarding preference for single rooms intimates that the relationship between social needs and privacy needs is not yet clear in the hospital environment.

The work environment requires a balance between the need to interact with co-workers and the need for quiet, uninterrupted and concentrated time. The trend towards open work environments with the objective of improving communication has had the unintended consequence of office workers finding these environments often too noisy, and lacking acoustic and visual privacy (Gensler, 2006).

Assuming that the basic needs of shelter, safety & security, and belonging needs are satisfied, Maslow's next level is the need for self-esteem. Providing for privacy via the physical environment helps the occupant to develop a sense of self and healthy ego (Proshansky et al, 1970). Altman (1975) claims self-identity to be 'central to human existence' and that achieving desired levels of privacy can assist the development of self-esteem. Without a place to go to reflect and be alone, the person might begin to question their self-worth. Westin (1970) defined four functions of privacy:

1. personal autonomy deals with the central core of the self and issues of self-worth, self-identity and independence.
2. emotional release helps to obtain that feeling of being "off stage".
3. self-evaluation involves the integration of experiences, making sense of the person's relationship to the world.
4. limited and protected communication is the process by which a small group can be alone and confidences can be shared.

The need for socialization and privacy are two ends of the environmental needs spectrum. Too much social interaction and this is crowding. Too much privacy and this is isolation. The built environment should not only provide for opportunities for social interaction; it must also provide a place for the occupant to get away socially and seek a place of refuge - a private place. A health-enhancing environment provides the occupant *choice* of the level of social interaction from one end of the spectrum to the other – to be with others or to be alone.

3.2 iii) Status

Cooper Marcus speaks of the importance of the messages that individuals send to the world about themselves via their home (Cooper Marcus, 1995). Similar to Steele's (1973) dimension of symbolic identification, status is a message sent by the occupant of a space interpreted by others about who the occupant is, what their position in society is, and what their values are. For example, the choice of materials and the maintenance of a front door sends a message to the outside world by the occupant of the home. Consider the message that a well maintained oak front door with a polished brass knocker sends compared to a cracking plywood door with exposed wires hanging out the doorbell button. These are environmental messages sent out to project our place in the social order of the world.

In the workplace, the common habit of attributing space as a reward is highlighted by Steele (1986) and Vischer (2005). The importance for children to be able to manipulate the physical environment for healthy developmental growth is emphasized. This act allows the child to develop the self and differentiate themselves from others. Building self-identity and consequently self-esteem via manipulation of the physical environment is one way in which children learn about themselves. But manipulating the physical environment also established a sense of social order. With this social order, comes the messages that are interpreted by others from the physical environment. This is how the built environment plays into the concept of status.

The built environment can send positive status messages, such as taking pride of ownership of an object, place or home. But the messages can also be interpreted negatively, for example by excluding people. The frequent flyer airport lounge is an

example of status used to exclude persons from a space. It is important to recognize that status is part of the environmental toolkit for habitable environments.

Status should be used in a positive sense to promote growth or to reach a higher level of habitability, rather than using it in a non-productive sense. Such non-productive usage of space for status can be demonstrated in an office environment that provides a small work surface for administrative staff when their job requires them to work daily with large plans. At the same time the vice-presidents are out of the office 80% of the time and maintain their spacious, vacant corner offices with the natural light and views. What message does this send to the staff?

3.2 iv) Personalization

I hear, and I forget
I see, and I remember
I do, and I understand

Chinese Proverb (cited from Sommer, 1983)

Personalization is described as the deliberate decoration or modification of an environment by its occupants to reflect their identities (Sommer, 1974; Sundstrom, 1986). Personalization here is defined as *the manipulation of the physical environment*. It is not defined as the number of objects per unit area. Personalization is the physical act of reaching out, selecting, and touching.

Personalization involves controlling boundaries between the self and the physical environment. Altman (1975) describes personalization as a form of territorial marking to designate ownership, either temporary or permanent and to regulate social interactions. The act of simply touching an object has been shown to create a sense of ownership of the object (Brown, 1987). By touching and consequently "owning" an object, developmental theorists posit that children begin to define a relationship between themselves and the outside world (Inhelder & Piaget, 1958). Manipulating objects and choosing objects sends messages to others about the occupant of the space (Csikszentmihalyi & Rochberg-Halton, 1981).

The need for an occupant to personalize their environment is a recurring theme in the review of RBD guidelines. Objects from the resident's past have a curative effect for a person with Alzheimer's. Often the emotional memory remains intact long after the loss of

other neurological functions. The act of displaying objects from the person's life is comforting to them.

Displaying items is relevant to many groups. For example, children's environments should foster personal identity and encourage the development of competence (Weinstein & Thomas, 1987). When a child displays their 'treasures' (toys, art works, discovered sea shells and rocks), this is an act of defining their identities. They choose these rocks because they imbue meaning to them. The objects help to define the emerging self of the child. Cooper-Marcus (1995) describes the home as the ground for the development of the child's immersing identity and of the self. Children need to be given choices in their environment in order to develop a healthy self-identity. The physical manipulation of the environment is an important process in the healthy development of the child (Piaget & Inhelder, 1969). Personalization of the work space has also shown to be positively associated with employee well-being (Wells, 2000). Supportive environments allow the occupant the ability to personalize their space, where personalizing means to manipulate the physical environment.

The case of the offices of advertising firm Chiat Day illustrates the importance of claiming territory and personalizing the work environment (Vischer, 2005). Chiat Day's attempt to eliminate personal offices and workstations ended in revolt (perhaps 'mutiny' is a better word) with several employees quitting when they discovered they would not be given a designated place in the office. The entire 'experiment' ended when the firm of Chiat Day was sold and the new owners returned the offices to traditional territorial office spaces. This exercise highlights the importance of claiming territory, personalization and status related to space.

3.2 v) Territoriality

That's MINE!

Author's daughter, age 3 years

Territoriality includes the control of resources via the demarcation and defence of space, social processes such as dominance patterns, and cognitive and affective ties that support the occupant's identity (Brown, 1987). Altman defines territorial behavior as:

Territorial behaviour is a self/other boundary-regulation mechanism that involves personalization of or marking of a place or object and communication that it is 'owned' by a person or group. Personalization and ownership are designed to regulate social interaction and to help satisfy various social and physical motives.

(Altman, 1975, p.107)

Altman (1975) describes three types of territory: primary, secondary and public territory. Primary territory is the space that is controlled or owned by the occupant, for example the home or the bedroom. These territories are clearly identified by the owners as theirs and have a permanent quality. Secondary territory is more an ambiguous space such as a seat in the library where one has left a jacket and some papers. The person does not have the same degree of control over the space as in primary territory and it is a temporary ownership of the space. It can be entered by others at any time and the boundaries are not as clear as with primary territory. Public territories have a temporal quality and are available to anyone, as long as they follow the norms and rules of society, for example in a park or in a shopping mall.

Territoriality will be defined here as a boundary regulating concept in which physical, social and psychological processes assist in claiming ownership. Physical boundaries can be used to moderate social interaction such as when tables and chairs are moved around for a meeting. Psychological boundaries can also be used to moderate social interaction, for example, 'invisible' boundaries are set with 'off-limits' rooms for children. Psychological boundaries can be expressed in terms of subtle territorial clues that are sent by the user of the space as well, for example leaving a coat over a chair in a café denotes temporary 'ownership' of that space.

The concepts of territoriality and personalization are closely intertwined. Both involve some form of marking of place. However, the difference between the two concepts is that personalization involves only physical objects, whereas territoriality can involve both physical objects as well as psychosocial boundaries.

3.3 vi) The Meaning of Home

'They said they could operate and put a plate in, but I would have to stay in the hospital longer. Or they could immobilize my shoulder and send me home sooner,' the 92-year old Montrealer said.

Guess which one she chose.

'My dear, I came home,' she said with a twinkle in her eye. 'My home means everything to me.'

The Montreal Gazette, Homefront section, October 9, 2004 (p.E-1)

Meaningful dimensions of home appear regularly throughout the RBD guidelines reviewed in Chapter 2. The title of Cohen & Weisman's (1991) book, "Holding on to Home" prompts an intuitive understanding of the importance of home for the well-being of persons with Alzheimer's. The hospital environment should also permit the patient the ability to personalize and claim ownership. Children's environments must not have an 'institutional' character. Work environments must offer a sense of privacy as well as social contact, comfort, and the opportunity for growth. These are qualities that are offered in the home setting. The theme of "homelike", "domestic", or "non-institutional" environments permeates the literature on creating supportive environments and is seen repeatedly in the review of the RBD guidelines.

Many studies about home and the meaning of home describe the supportive qualities of home, as will be shown in this section. However, the literature has yet to propose that the concept of 'the meaning of home' is integral to a health-enhancing environment. Furthermore, environmental needs models have never included the meaning of home into their models. Including the 'meaning of home' into this theory of environmental needs/health enhancement is an original contribution. This has not been done in previous needs models.

The relationship between physiological health and home was highlighted in the Whitehall study nearly three decades ago (Marmot et al., 1978). Over 17,000 British civil servants were followed across a 10-year span in order to study the relationship between job status and physiological health. Contrary to intuitive thinking, the results revealed that workers in lower status job levels were four (4) times more likely to die of coronary heart disease than workers in higher status job levels. One would have expected the higher job status workers to have been more susceptible to such illnesses with the assumption that they had higher stress levels in their jobs. However, even when coronary heart disease factors were taken into account such as blood pressure, smoking and cholesterol, the workers in lower job-status levels were still 2.6 times at greater risk than the higher level job-status workers. One explanation offered for this discrepancy was that the workers with higher status jobs had lower blood pressure measurements *at home*. This observation opens the door to speculation. If a person's home can induce lower blood pressure and consequently better health benefits, then it is fitting to ask: What elements of *home* provide this cathartic effect?

A thorough review of the literature on the meaning of home revealed several supportive qualities of home (Deprés, 1991). The words in brackets are added here to draw emphasis to the health-enhancing dimensions already described in this chapter. Després described home as:

- permanence and continuity (shelter);
- security and control (safety & security);
- refuge from the outside world (privacy),
- relationships with family and friends (social interaction);
- center of activities (social interaction);
- acting upon and modifying one's dwelling (personalization);
- indicator of personal status (status);
- reflection of one's ideas and values (status & the self);

Deprés' work highlighted many of the supportive qualities reviewed in the RBD guidelines which suggest that qualities of 'home' might be integral qualities to habitable environments.

Le Corbusier described the house as "a machine for living". But a house is not a home. A home consists of more than walls, floors, furniture and other physical and functional elements that assist in the tasks of living. The home also has important social (Mead, 1949; Rapoport, 1968) and psychological meaning (Cooper Marcus, 1997; Serfarty-Grazon, 1999). Csikszentmihalyi & Rochberg-Halton (1981) state that "the home is much more than a shelter...the home becomes the most powerful symbol of the self..." (p. 123). The home can be seen as sending messages to the world about who we are (Becker, 1977, Cooper-Marcus, 1995). The home's architecture, its state of repair (or disrepair), its location – all of these aspects tell a story about who we are. Even the interior of the home, the items that are displayed in the house such as heirlooms, photographs of family members, gifts from friends, objects from travels - these objects have meaning to the occupant. Choosing and then deciding to display these objects tells the story of who this person is, or who they want to be.

The importance of home as integral to creating a 'self' is supported by the work of Porteous & Smith (2002) on the subject of 'domicide'. They describe domicile as "the murder of home". It is the loss of home from fire, hurricane, earthquake, or some such disaster. When a home is lost to such an event, then so is the evidence of the former life of the person who had once lived there. With the loss of home, a part of the person's identity is lost. The person loses the physical traces of the self created via their home.

Furthermore, they no longer have a place they can call their own, to lock the door and shut out the world. Without a home, without shelter, they become open and vulnerable to the world. They lose control of their boundaries.

Altman (1975) points out that defining one's boundaries is integral to defining the self.

Self-identity is partly dependent on the ability of a person to define his or her own limits and boundaries... Thus the ability or failure to regulate self/other boundaries is an important contributor to self-definition because it is a source of self-knowledge based directly on overt ongoing interaction. (pp. 46-47)

In French, home is 'chez soi' which translates literally to 'at one self's'. Serfaty-Garzon (1999) explains that 'chez soi' concurrently means many things such as: interior, privacy (intimacy), house, hearth, home, residence, dwelling, and more due to the presence of the word 'soi' ('one's self').

Le *chez-soi* est tout cela à la fois – intérieur, intimité, maison, foyer, logis, domicile, habitation - mais aussi plus que cela, comme l'indique la présence du terme « soi ». Le chez-soi est le lieu de la conscience d'habiter en intimité avec soi-même. Parce qu'il est l'espace de la prise de conscience, il est aussi celui de la connaissance de soi, de ses capacités et faiblesses. Intimité avec la tentation de l'ancrage, de l'arrêt, de la stabilité et de ses sécurités. Conscience du potentiel d'aliénation que porte cette stabilité. Partir de chez soi prend ainsi le sens d'une prise assumée du risque de la vie sociale, tandis que rentrer chez soi devient un repli vers le repos en soi. (pp. 62-63).

The home is a place where a person can be themselves, away from the scrutiny of the outside world. Serfaty-Garzon highlights the importance of the self in the relationship to home. To be at home means to be at 'one's self'. She explains that by going outside of the home, safety of the familiar is left behind in order to venture out into the social world. To return home is to find place to rest and to recharge.

An experiential study by Pennartz (1999) asked the question to the resident of the home: "where is it most pleasant in the home?" Both architectural and psychosocial factors are shown to contribute to the atmosphere of home. Pennartz describes the psychosocial aspects of home as: communicating with each other; being accessible to one another; being relaxed after having finished work; being able to do what one wants to; and being occupied, absence of boredom. Pennartz demonstrates that the supportive qualities of home lie in the person's ability to choose, to control access to their self, and to control their physical boundaries. Sebba & Churchman (1986) empirical work further demonstrated that the ability for an individual to control their environment is an important quality of home.

Serfarty-Garzon emphasizes that the home represents a place where one can truly be one's self due to the ability to (both literally and figuratively) 'close the door' to the outside world. Pennartz and Sebba & Churchman highlight two important qualities of home which are the ability to manipulate the physical environment, as well as to control the degree of social interaction versus privacy.

Porteous & Smith's (2001) thorough content analysis of the concept of home revealed three major categories salient to their typology of home. These include: the spatial and physical; the symbolic meaning; and the psycho-social. Sixsmith's (1986) exploratory study of the meaning of home also found similar categories. Three broad categories that surfaced in the study are physical features, social relations, and the self (see Figure 9). These three categories fit well with the WHO definition of health as a state of complete physical, mental and social well-being. Habitable environments are places where the person has a sense of control of these three qualities. The literature review of the RBD guidelines presented in chapter 2 demonstrates that certain qualities of home provide a higher level of habitability. Here, the 'meaning of home' is described as the physical and social aspects of home, as well as those aspects of home pertaining to the self.

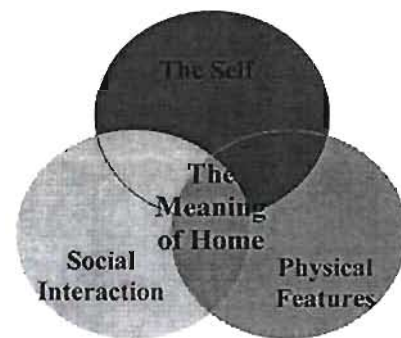


Figure 9 - The meaning of home (based on Sixsmith, 1986)

What do we mean when we say we feel "at home"? We aren't in our home, but there is a feeling of comfort that is associated with home. This feeling of home, or 'the meaning of home', is a dimension that must be understood in order to achieve a health-enhancing environment. The environmental frameworks reviewed consistently emphasize that this dimension is necessary for habitability. To place the meaning of home at the pinnacle of the hierarchy of environmental needs here is an original contribution to the Environment – Behaviour literature.

Oswald and Wahl (2004) describe the status of the present state of research on the meaning of home on health outcomes. They conclude from an exhaustive literature review of housing and health (for the elderly) that although the relationship between the *functional* aspects of housing and health is well-researched with empirically strong evidence, however they indicate that strong empirical evidence is still lacking to demonstrate the link between the meaningful aspects of home and health. Although Oswald and Wahl's research focuses on gerontological issues, the conclusion remains the same across the lifespan. Further research is still needed to examine the meaningful aspects of home and how these aspects affect habitability for all ages in all environments.

"...place is meaningful to people, and... the place called home is the most meaningful of all." (Porteous & Smith, 2002, p.6)

3.3) Summary: Toward a Supportive Environmental Framework

This chapter highlights recurring themes from the research-based design (RBD) guidelines presented in the previous chapter. These recurring themes form the basis of the proposed integrative environmental framework for habitability. The hierarchy of environmental needs is shown in figure 10.

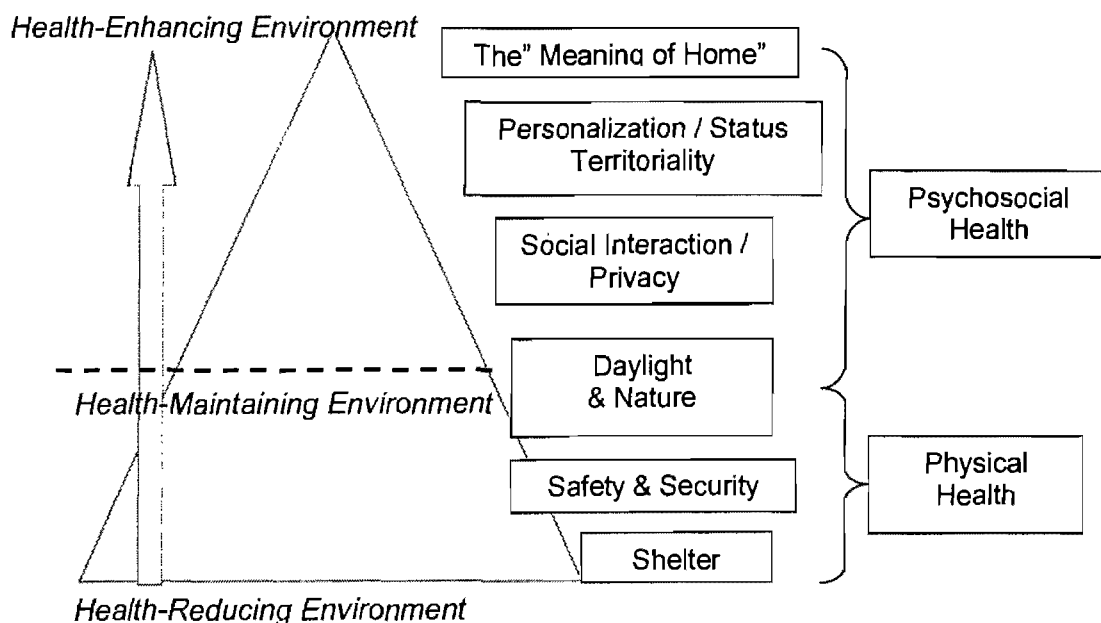


Figure 10 - The Hierarchy of Environmental Needs

This is not so much a 'hierarchy' per se, but more of a framework for the design, construction and assessment of habitability of the built environment. The hierarchy should not be viewed as a grocery list with needs being crossed off once achieved. The transactional nature of human needs would not permit such an analogy. The objective is to prompt discussion about dimensions of the built environment that support habitability.

The hierarchy of environmental needs shows that a *health-maintaining environment* is achieved when basic needs of shelter, safety & security are satisfied, which provides for a certain level of physical health. If these needs are not satisfied, this becomes a *health-reducing environment*. However, the physical environment can offer more to the occupant than simply protection from the elements and bodily harm; it can encourage a state of physical, mental and social well-being.

The need for access to nature and daylight is integral to habitability. It is proposed that, much like the Habitability Pyramid of Vischer (1989) where the "Habitability Threshold", is indicated just above Health & Safety, so too is the line drawn here, designated as a *health-maintaining environment*, in the hierarchy of environmental needs just above "Physical Health". It is proposed that if an environment does not provide for safety and security as well as a certain amount of daylight and access to nature, this environment will not enhance an individual's health. It will simply maintain health and not enhance health.

The need to belong is negotiated spatially by the ability to choose to interact with others or to be alone. In addition to providing for the need for social interaction, the built environment must provide for the need for privacy. The person must be able to choose to be alone, or to close the door. The need to personalize, to establish a sense of status, and define territory are also integral to the hierarchy of environmental needs. Lastly, the "meaning of home" is found to be the final element to a *health-enhancing environment*.

The importance for the person to have a sense of control of their physical boundaries is revealed in the section 'the meaning of home'. The importance of control of physical as well as social boundaries is discussed in the next chapter, chapter 4 "The Individual Boundary Process (IBP)". The IBP is proposed as a mechanism through which a person regulates their boundaries for habitability.

CHAPTER 4

CHAPTER 4 – BOUNDARY REGULATION FOR HABITABILITY

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Chapter 4 – Boundary Regulation for Habitability

“...it may be the quality of the ‘microenvironment,’ both social and physical, that is critical to health...”

R.G. Evans, 1997, (p.22)

In the previous chapter, a review of RBD guidelines revealed an integrative framework for health-enhancing environments. The first objective of this thesis was to propose such a framework. The upper section of the proposed hierarchy of environmental needs is described as “psychosocial health” which includes the need for social interaction and privacy; personalization; territoriality; status; and finally the ‘meaning of home’. Following the development of this framework, the author began investigating these upper dimensions of the hierarchy in the home setting with parents and their children. During the analysis of this data (presented later in Chapter 5), a relationship between the individual’s sense of control of their boundaries and their self-assessed health was revealed. The Individual Boundary Process (IBP) emerged.

The field work demonstrated that habitable environments favour an individual’s ability to manipulate and have a sense of control over their environment. This is control of physical as well as psychosocial boundaries. This boundary regulation is described here as the Individual Boundary Process (IBP).

The IBP is presented now to assist the reader to better understand the analysis of the data analysis and results presented in Chapter 5 and 6.

4-1) Privacy Theory and Boundary Regulation

“Privacy is an interpersonal boundary-control process, which paces and regulates interaction with others.”

Irwin Altman, 1975, (p.10)

In “The Hidden Dimension” Edward T. Hall (1966) describes a fifteen-year population density behavioural study of Norway rats performed by John Calhoun, an American ethologist. Although the intent of the experiment was to observe the natural evolution of the rat population growth, Calhoun also observed particular social behaviours related to this population growth, including the breakdown of social order in the ‘behavioural sinks’. The term ‘sink’ describes the locations where parts of the rat population did not have a clear hierarchy of space or social order. In these sinks, the pups did not survive, the males would eat the pups, and care was not taken of the nests. Tail biting became a common activity in this area as the rats became more harassed and social order broke down. At the far ends of the sinks, one dominant male managed a ‘harem’. These nests at the far ends were neat and the survival rate of the pups was high. The rat groups at the far ends of the cage had a sense of control over their boundaries. Calhoun's experiment demonstrated the importance of ownership of space, defining territory, and setting physical boundaries as integral to the basic health of the rats.

One often cited theoretical approach for understanding human environment – behaviour relationships was developed by Irwin Altman in his treatise “*The Environment and Social Behavior*”(Altman, 1975). Altman described privacy as the central regulating concept binding four key E-B concepts together: privacy, crowding, personal space, and territory. He defined privacy as ‘*the selective access by others to the self or to one's group*’. With this process, an individual controls their interaction with the social environment. Calhoun's experiment revealed that the need to be able to choose to be alone is an integral part of a healthy environment.

In the review of RBD guidelines in Chapter 2, concepts of personal space and crowding were not found to be major contributing factors to the development of health-enhancing environments. Crowding is a negative concept and the objective of this thesis is to examine positive P-E relationships. Certainly being aware of the negative health impacts of crowding is important, but the objective here is to highlight dimensions that *support* well-

being. It is not the intent here to promote designing environments with the objective of *reducing negative impacts* such as crowding. Furthermore, there was little mention of the need to address personal space per se in the review of the RBD guidelines. In the review of the RBD guidelines, recurring themes include the need to balance controlling space for social interaction and space for privacy, the need to personalize, and to define and maintain territory.

Altman, a social psychologist, appeared to concentrate on the social aspects of E-B relationships such as crowding and personal space. The hierarchy of environmental needs demonstrates that supportive environments address more than the social aspect of boundary regulation. Boundary regulation for habitability requires balance between both physical and social environmental dimensions. Altman often uses the term 'interpersonal' when speaking of this boundary regulating process. The term "individual" will be used in order to de-emphasize the person-person perspective of Altman's 'interpersonal boundary regulating process'. The boundary process for habitability is from the perspective of the individual.

Altman used the terms 'boundary', 'regulation', and 'control' interchangeably. It will be assumed that the term "boundary" implies regulation as well as control. The mechanism through which habitable environments are achieved will be described here as the *individual boundary process (IBP)*.

The objective here is to seek habitability and to understand how boundary regulation plays into the achievement of health-enhancing environments. The theoretical boundary approach for supportive environments must focus on the physical environment (E) as well as the social environment (e). It is proposed here that the person-environment relationship for habitability is a *P-Ee relationship*. A person must be able to balance their physical (territoriality and personalization) and social (privacy and social interaction) boundaries (Figure 11).

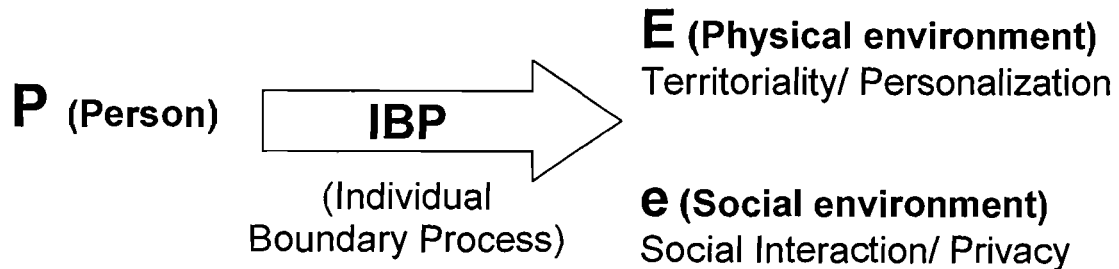


Figure 11 - P–Ee Relationships for Habitability

The *individual boundary process (IBP)* will be described here as having the following characteristics:

1. It is a dynamic, dialectic process. It is a balance between openness and closedness shifting across time.
2. It is an optimizing process. It is the balance between desired and achieved boundary conditions. Too much or too little of one of the E-B concepts leaves the occupant dissatisfied. For example, the balance between the need for privacy and social interaction is an optimizing process.
3. It involves both E-centric (physical environment) and e-centric (social environment) Environment-Behaviour concepts.

Health-enhancing environments require this optimization, dynamic and dialectic activity. Boundaries, be they physical or social, are constantly being defined and maintained by the individual in healthy P-E relationships. Many of the qualities that Altman describes for privacy are the qualities that define the individual boundary process (IBP).

Altman claims privacy to be the key process that binds the concepts of privacy, crowding, personal space and territory together. However, in the case of the IBP, privacy is but one E-B concept that is manifested by regulating boundaries. It is proposed that the individual boundary process (IBP) be the central regulating concept that binds the four habitability concepts together: territoriality, personalization, social interaction, and privacy.

4.2) Desired and Achieved Boundaries

“Happiness is having a large, loving, caring, close-knit family in another city”

George Burns

Habitability is realized when a person achieves their desired control of their physical and psychosocial boundaries. If this desired boundary condition is not achieved, then this becomes a health-reducing environment. Figure 12 illustrates this continuous process.

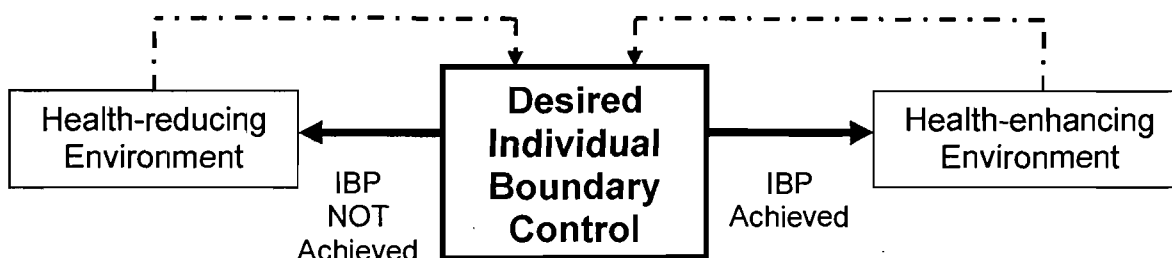


Figure 12 - Desired Individual Boundary Control

4.3) Positive Individual Boundary Process (IBP) Concepts

In supportive environments, the individual boundary process is a positive process, as opposed to a negative process. If an individual's perception of their P-Ee relationship is negative, subsequent P-Ee situations are interpreted negatively. For example, social interaction can either be interpreted negatively as crowding or positively as belonging (Table 2). Positive IBP Concepts produce supportive environments. Negative IBP concepts do not.

Table 2 - Negative vs. Positive IBP Concepts

IBP Concept		... as a negative		... as a positive
Territoriality	<i>means</i>	exclusion	<i>or</i>	ownership
Personalization	<i>means</i>	clutter, mess	<i>or</i>	self-identity
Social Interaction	<i>means</i>	crowding	<i>or</i>	belonging
Privacy	<i>means</i>	isolation	<i>or</i>	solitude

Therefore, when the individual boundary process (IBP) is managed well, the environment will be used as a tool for constructing positive environmental relationships. These positive relationships lead to a high degree of habitability.

4.3) Summary – The Individual Boundary Process (IBP)

A central Environment-Behaviour concept through which a health-enhancing environment is achieved is proposed. The individual boundary process (IBP) is put forward as the key process through which the concepts of territory, personalization, social interaction and privacy are manifested. The IBP is a dynamic, dialectic and optimizing process and can be either E-centric (focusing on the physical environment) or e-centric (focusing on the social environment). Supportive environments promote positive P-E relationships which are negotiated through the IBP. The IBP is the mechanism through which habitability dimensions are achieved (Figure 13).

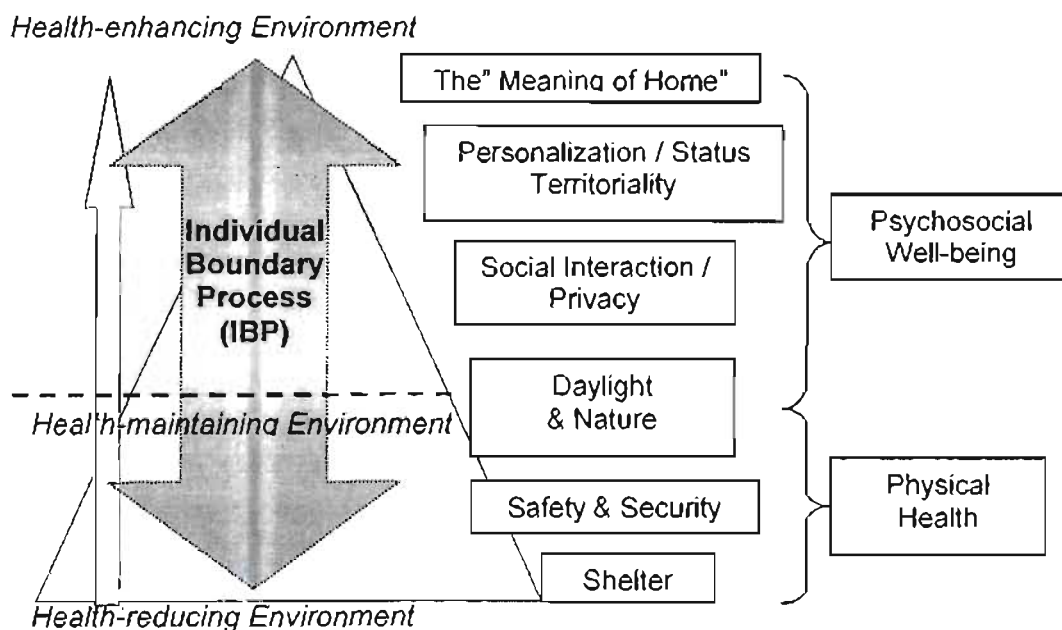


Figure 13 - The Individual Boundary Process (IBP) in the Hierarchy of Environmental Needs

As habitability increases, the environment goes from being a health-reducing environment (lacking basic environmental needs such as shelter, safety and security), moving up towards a health-maintaining environment (shelter, safety & security, and a certain amount of daylight and access to nature is provided) to a health-enhancing environment where psychosocial environmental dimensions are achieved..

Health-enhancing environments allow a person the ability to regulate their boundaries. They allow a person to have a sense of control over the IBP. Recall that Altman often used the terms “regulate”, “boundaries” and “control” all together. The individual boundary process (IBP) infers the need to control or regulate. By empowering a person with their IBP, they are then able to experience a health-enhancing environment by having the ability to regulate:

- their physical territory and their need to personalize; and
- their desired social interaction and privacy;

The meaning of home was described in the previous chapter as having the important quality where an individual can have a sense of environmental control. It is in the home where the person often has the most control over their boundaries – physical and social. Other important dimensions to ‘home’ include the physical features, social relations and the self.

In the next chapter, the psychosocial dimensions of health-enhancing environments as well as the role of the IBP are investigated in 17 Montreal family homes with interviews with 17 parents and 27 children.

CHAPTER 5

CHAPTER 5 – TESTING THE FRAMEWORK

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Chapter 5 – Testing the Framework

Objective no.3 is “to test the proposed integrative framework empirically, in particular the ‘higher’ needs which include the need for social interaction and privacy, personalization and status, and the ‘meaning of home.’” This chapter presents the methods used to collect this data. 17 parents and 27 children are interviewed in 17 Montreal family homes. ‘Home’ in this context is the interior setting of the physical dwelling or household. Data about the place where the parent feels most at home in their home and the child’s ‘favorite place’ in their home is analyzed statistically as well as for content.

The original purpose of this field work was to better understand the higher dimensions of the hierarchy of environmental needs. But as mentioned previously, the importance of regulating boundaries began to emerge as integral to health-enhancing environments and is therefore explored as well in this field work.

5.1) Sampling

The participants in the study are all residents of the Montreal area. The criterion for selection was that the family had at least one child between the ages of 4 to 10 years old. One parent and one child had to be available to be interviewed in the participants’ home.

24 persons were contacted by email on August 5, 2005. The persons contacted were acquaintances of the researcher. 22 were parents, 2 were fathers. 15 families (13 mothers, 2 fathers) had children in the same elementary school as the author’s children. Three (3) persons did not respond to the email. Three (3) families’ schedules were too difficult to coordinate for an interview. One (1) mother refused to participate. 17 families (participation rate of 70%) participated in the study. 17 parents (N =17) and 27 children (n=27) (15 males; 12 females) were interviewed from August 10 to August 24, 2005. The mean age of the children is 7 years old ($\sigma = 1.8$). Six (6) families had more than one child between the ages of 4 – 10 years old in their home. In ten (10) family homes, one child was interviewed; in four (4) homes, two (2) children were interviewed; and in three (3) family homes, three (3) children were interviewed.

Of the seventeen (17) homes visited in this study, eleven (11) homes were in Montreal West or adjacent, a small community about 12 km west of downtown Montreal in the province of Quebec and consists mostly of medium density housing. Four (4) of these homes were

attached units, four (4) were detached units, and three (3) were rental apartments. One (1) residence was a ground-floor attached rental apartment on the Plateau, a medium-density city community about 2 km north-east of downtown Montreal. The five (5) remaining homes were detached suburban houses in the west island of Montreal, about 15 km west of downtown Montreal.

5.2) Measurement Instruments

The measurement instruments used in the field work are based on tested and validated tools from a recent study on housing quality and mental health in the United States (Evans, Wells, Chan, & Salzman, 2000).

The measurement instruments used here consist of three (3) parts: i) Observer Assessment; ii) Parent Checklist; iii) and Child Interview (See Appendix). These three tools are taken from validated and tested studies and are better known as the Housing Quality Index; the Children's Behaviour Questionnaire; and the PERI Mood Self-assessment (Evans et al., 2000).

Upon entering the home of the participant, the interviewer asked to sit with the parent and the child at a large table which was often the main dining area of the home. The interviewer would then briefly explain the objectives of the study as well as the interview procedure. The entire duration of the procedure was approximately 25 minutes.

5.2 i) Observer Checklist

The Observer Checklist was based on the Housing Quality Index developed in a recent study on housing quality and mental health in the United States (Evans, Wells, Chan, & Salzman, 2000). Evans et al's (2000) Housing Quality Index was then further tested in a study on the relationship between housing quality and children's socioemotional health (Evans, Salzman, & Cooperman., 2001). This study was then duplicated in Canada (Gifford, 2003). This instrument incorporates observations of structural quality, privacy, indoor climate, hazards, cleanliness/clutter, and children's resources.

The Housing Quality Index in the US and Canadian studies tended to focus on the physical qualities of the home, such as assessing surface damage, amount of paint peeling on the walls and ceiling, exposed wiring, etc. The purpose of the empirical study here is to examine the psychosocial dimensions of the proposed framework. Therefore, items were added by the author in the Observer Checklist, as well as questions were asked in the Parent Observer

checklist and in the Child Interview to better understand how E-B higher needs relate to occupant well-being.

The researcher would tour the home taking note of aspects of the home, as well as completing a brief checklist of 15 items requiring answers on a scale from 1 to 5. Some of these questions were taken from a previously established Housing Quality Checklist, (Evans, Saltzman, & Cooperman, 2001; Gifford, 2003). Questions were added to this previously established measurement instrument to investigate the higher needs in the hierarchy of environmental needs as well as to investigate the occupant's ability to regulate their IBP. Some of these questions include "is the child's artwork on display?" and "does the child have a place to store his/her treasures?" Reference photos were used to ensure internal validity for the questions of "is the house clean & uncluttered".

5.2 ii) Parent Checklist

The parent was asked to complete three (3) separate questionnaires: the Parent Questionnaire, the Parent Mood Self-Assessment Questionnaire and the Child Behaviour Assessment Questionnaire.

The two measurement instruments from the US and Canadian studies were used here to assess the mother and the child's health (Evans et al., 2000). The first measurement instrument, called in this study the Parent Mood Self-Assessment, is the Demoralization Index of the Psychiatric Epidemiology Research Instrument (PERI) (Dohrenwend, Shrout, Egri, & Mendelsohn, 1980). The second instrument, called in this study the Parent Assessment of Child Behaviour Problems, is the Children's Behavior Questionnaire which is a reliable and valid index in which the parent gauges the child's behavior on a 5 point scale (Rutte, Tizzard, & Whitmore, 1970).

5.2 ii a) Parent Questionnaire

The brief questionnaire included 15 questions with scaled answers from 1 to 5 and is the researcher's own design. Examples of some of these questions include: "how would you rate your child's physical health?" (1-not healthy; 5-very healthy), "how would you rate your own health?" (1-not healthy; 5-very healthy), "how you feel about your home?" (1-negative; 5-positive), as well as two (2) semi-directed interview questions: "Where in the home do you feel most at home?" and "Why there?"

5.2 ii b) Parent Mood Self-Assessment

The parents were asked to complete a mood assessment questionnaire. This validated tool, the Psychiatric Epidemiology Research Instrument (PERI: Dohrenwend, Shrout, Egri, & Mendelsohn, 1980), is a standardized symptom checklist for nonclinical populations. This instrument was used in recent studies on housing quality and mental health for adults (Evans, Wells, Chan, & Saltzman, 2000) and for children (Evans, Saltzman, Cooperman, 2001 ; Gifford, 2003). The participants are asked if they have felt particular symptoms on a five point scale (1-none of the time; 5-all of the time) in the last 3 months. There are five questions in this assessment tool. The PERI has been used across wide-ranging cultural, geographical and economic samples in North America and abroad.

5.2 ii c) Parent Assessment of Child Behavioural Problems

The child's behaviour index used was the tested and validated Rutter Children's Behavior Questionnaire (Rutter,1970) used in the Evans et al (2001) and Gifford (2003) studies on housing quality and health. The parents were provided a list of 23 behavioural traits often shown by children and were asked to indicate the degree to which each behaviour applies to their child (certainly applies; applies; applies somewhat; usually does not apply; does not apply). Examples of some questions include: "is afraid of new things or new situation"; "often appears miserable, unhappy, tearful or distressed", "tends to do things on his own; rather solitary".

5.2 iii) Child Interview

The child was asked six (6) questions. The interviewer took notes while the child answered.

The questions included four (4) of these questions are semi-directed questions:

1. "Could you describe your home to me, as if I were someone who had never seen it?"
2. "Is there anything about your home that makes it special, different or better than other people's homes?"
3. "Do you have a favourite place? Where is your favourite place?"
4. "Do you like to be at home?"

A fifth question was asked.

5. "Whose home is this?"

The children's answer was scored on a scale from 1 to 5, 1 (others, such as the landlord); 2 (my parents); 3 (my siblings); 4 (my family), and 5 (mine). If the child said the home was both 'my parents' and 'mine', the higher of the two scores was assigned.

6. The child was then asked to draw a picture of "inside your home of places and/or things that are important to you." The child was given the choice of markers, coloured pencils or a HB pencil and eraser.

If more than one child was to be interviewed, the children were interviewed separately from the other child(ren) so as not to be influenced by each other's replies.

5.3) Results

5.3 i) Participants

Parents' Mood Self-assessment Results

In this study, the overall assessment by the parents of their mood as measured by the Parent Mood Self-Assessment Score on a scale of 0 – 25 was 19 with little deviation (mean = 19, $\sigma = 0.28$). Figure 14 shows the distribution of the scores for 17 participants, all of whom are parents. One could say that the mental state of the sample consisted of rather 'healthy' parents, meaning that there is no indication of problematic moods in the participants through this measurement instrument.

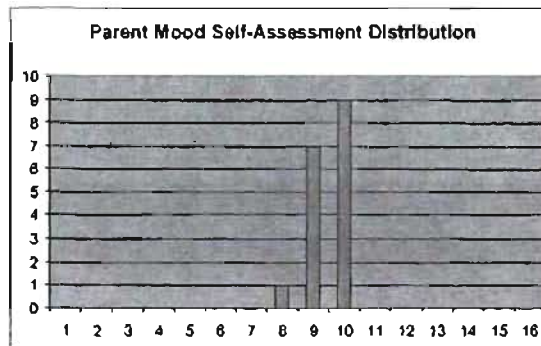


Figure 14 - Parent Mood Self-Assessment Distribution

Also, in reply to the question "how would you rate your own physical health?" the parents self-assessment of their own physical health is found to be very good with a median score of 5 on a scale of 1 (not very healthy) to 5 (very healthy) and $\sigma=0.03$. The data indicates that most parents interviewed consider themselves very healthy.

Child's Behaviour Problems as Assessed by the Parent

However, in regards to the results from the Parent-Assessed Behaviour Problems of the child, the distribution of the scores is quite wide. The scores varied from 80 to 122, indicating a wide discrepancy in behavioural problems as assessed by the parents in the group of children interviewed. The score had a mean of 113 ($\sigma=10$). Figure 15 shows the distribution of the scores for the 26 children.

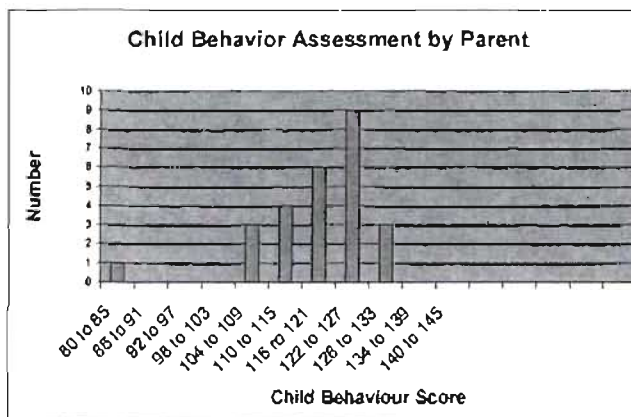


Figure 15 - Parent Assessment of Child Behaviour Problems Distribution

The parent-assessed physical health of the child was scored very high with a mean of 5 on a scale of 1 (not healthy) to 5 (very healthy) ($\sigma = 0.09$). The parent was asked the question "how would you rate your child's physical health?" The data shows most parents interviewed rated their child's health as very healthy.

5.3 ii) Data Analysis

5.3 ii a) Statistical Analysis

Responses obtained with the Likert-type scale (from 1 – 5) from the Parent Checklist, Observer Checklist, and the Child Interview measurement instruments were transferred into a correlation matrix (see Table 1). Pearson's correlations were computed for these variables (N=17). In the case of multiple children interviewed in one house, only the oldest child's results were used for this correlation (mean = 8 years old; $\sigma = 1.54$). Correlations between the variables for the youngest child in the home revealed only one significant correlation at $p = .05$ which was between the parent's Mood Self-assessment (MoMood) and the child's sense of ownership of the home (ChHomOwn). Table 2 below presents the correlations for the older children (n=17).

Table 3 - Table of Correlations Among Variables

corr/cov.	Interviewer Assessment			Parent Assessment			
	CInunclut	Artdispl	Treasures	Momfeel	MoMood	Childbeh	Chphyshlth
Artdispl	-.29						
Treasures	-.17	.23					
Momfeel	-.13	.48 *	.36				
MoMood	.17	-.22	-.41	-.03			
Childbeh	.21	.07	.07	.35	.45		
Chphyshlth	-.13	.06	.17	.19	-.14	-.01	
ChHomOwn	-.10	-.38	-.60 **	-.30	.50 *	-.25	-.03

NOTES:

The number in each cell represents the Pearson correlation between each set of variables.

* indicates correlation significant at $p \leq .05$

** indicates correlation significant at $p \leq .01$

LEGEND:

Interviewer Assessment as assessed by the interviewer:

CInunclut is the answer to "is the house clean & uncluttered" (1 not clean - 5 very clean) photo of cluttered environment used to assist in gauging scale.

Artdispl is the answer to question "is the child's art work on display?" (1 none - 5 very much)

Treasures Does the child have a place to store his/her 'treasures'? (1 no place - 5 lots of place)

Parent Assessment as assessed by the parent.

Momfeel "How do you feel about your home?" (1 negative - 5 positive)

Childbeh is score of Child Behavior Assessment Scale by parent (0 to 130)

Chphyshlth is parent's answer to question "How would you rate your child's physical health?"

Momood is score from Parent Mood Self-Assessment Scale (0-25). Higher score is positive mood.

Child assessment as assessed by the child.

ChHomOwn Whose home is this? 1 other person outside of family; 2 parents'; 3 the family; 4 both parents' and child's; 5 child's. If child gives more than one answer, higher score is assigned.

Significant positive correlations at $p \leq .05$ include the relationship between how the parent feels about their home with the quantity of children's art displayed in the home as well as the relationship between the parent's mood self-assessment with the child's sense of ownership of the home. Only one correlation was found to have significance at $p \leq .01$ for the older children in the sample. This was the negative correlation between the amount of place for the child's treasures with the child's sense of ownership of the home. Therefore, the data indicates that children with a high sense of ownership of their home do not have as many treasures on display as children with a lower sense of ownership of their home. Conversely, a child with a low sense of ownership of the home tended to have many places where their treasures were stored. The significance of this relationship was only to $p \leq .05$ for the younger children in the sample.

5.3 ii b) Content Analysis

Analysis of question to Parent: "Where do you feel most at home at home?"

Responses to the semi-directed interview questions by the parent (N=17) are presented in Table 3 and Table 4. Both tables assess the interview data from the parent's reply to the question "where do you feel most at home at home? Table 3 assesses the level of social interaction and privacy in that place. Table 4 qualifies the preferred places within the environmental needs framework developed in Chapter 3, physical, social and psychological environmental needs.

In Table 3, 83% of the responses to where the parent feels most at home involve a high level of social interaction, such as in the kitchen, the dining area, the family room, and the breakfast area. Only 17% of the parents' replies indicate a low level of social interaction as an important aspect to where they feel most at home in their home, such as in their bedroom. Only one (1) parent mentioned the bedroom as a place where she feels most at home (6%).

These answers were subsequently divided into four categories in Table 4: *functional*, *light & nature*, *social*, and *psychological*. When the parents were asked to explain why they selected that place for feeling most 'at home', 36% of the answers referred to the lighting and the natural quality of the space. Natural characteristics were mentioned including natural light, views, natural finishes (wood) and other natural elements (plants). One mother mentioned the colour of the walls in the living room and another mentioned the quiet in her study as important characteristics.

The functionality of the space was an aspect of the place which was mentioned 33% of the time. These include: "I like to cook", "nerve centre of the home", "close to activity centre of home", "do homework", and "cabinets are user-friendly". The need for a space to be functional in the home is a valuable aspect by several parents. Tied closely to the functionality of the parent's chosen place is the social aspect of the place. The parents often referred to the importance of family and being together, of helping and seeing the children, and eating meals together. Tasks such as cooking, eating, helping the children with homework are both functional and social. Functional and social aspects are mentioned 69% of the total number of reasons why the parents selected the place where they felt most at home. The parents mentioned comfort as an important characteristic of the place where they feel most at home, as well as some aspect that invokes memories. Psychological aspects were mentioned 30% of the time when asked about the place where they felt most at home.

Table 4 - PARENT - Level of Social Interaction Where Parent Feels 'at Home'

Parent					
		"Where do you feel most 'at home' in your home?"		Level of Social Interaction	
No.	ID#	Location	"Why there?"	Low (privacy)	High (social)
1	4	breakfast room	lots of light- close to activity centre of home		1
2	5	living room	comfort, wood, flowers		1
3	6	family room	it's the center of the house off the kitchen. I can prepare meals and watch the children play, or watch TV - it has a real "family" atmosphere.		1
4	7	living room	where we relax together		1
5	8	Every where in the room	my whole house is cozy and comfy		
6	9	kitchen	"nerve centre" of home; meal preparation; comforting		1
7	10	living room/dining room area	nice view, sunlight		1
8	11	1)bedroom/ 2)kitchen/ 3)living room	1)afternoon sun; 2) cabinets are user friendly; 3) large window and comfy couches	1	2
9	12	family room	lots of family time spent there		1
10	13	kitchen	social & functional		1
11	14	1) kitchen; 2)basement; 3) bedroom	1) (family) we love to cook; 2) (family) comfortable 3) (me) quiet time	1	2
12	15	livingroom	the walls are a vibrant color and the piano makes it feel cozy		1
13	16	kitchen	It's where we eat the meals together; we play games; do homework; draw; talk about what we do everyday		1
14	17	In the kitchen	Room where we spend most of our family time (talking, playing with the kids, eating...)		1
15	18	1) Kitchen!!! 2)my room 3) living room	1) I like to cook; I feel useful 2) I feel relaxed and comfy 3) the piano is there	1	2
16	19	in the den	mom: room is filled with memories of my youth and souvenirs from trips, books/ dad: fresh air, peaceful natural environment		1
17	20	1-The study; 2- the dining room	1-my books are there, I can work and be alone, it's quiet ; 2-it's the place where entire family gets together at meal times and talks to each other about their day, we talk and spend time together there	1	1
Total:				4 (17%)	19 (83%)

NOTES:

High Social Interaction places include: living/dining room, kitchen, family room, den unless mention privacy as important to these spaces.

Low Social Interaction places include: bedroom, study unless mention social interaction as important to these spaces.

Total number of parents interviewed N = 17; Total number of locations cited n = 23

Table 5 - PARENT - Aspects of Place Where Parent Feels Most 'At Home'

Aspect of Place	Interview Number																	No. times mentioned						
	1	2	3	4	5	6	7	8	9	0	10	11	12	13	14	15	16	17	Sub Tot.	Total (no.)	Total (%)			
Functional																								
functional			1			1		1		1	1	1		1	1	1						9		
practical			1																			1		
"I feel useful"																1						1		
	<i>Functional Aspect:</i>																		11	33%				
Light & Nature																								
Natural light	1						1	2			1											5		
Natural finishes (wood)		1																1				2		
Natural elements (plants)		1																1				2		
View							1															1		
quiet												1								1		1		
colour													1									1		
	<i>Light & Nature Aspect:</i>																		12	36%				
	<i>Physical Aspect</i>																		23	69%				
Social Aspect:																								
activity centre of home	1		1			1																3		
together			1	1						1				1								4		
family			1						1		1	1			1					1		5		
	<i>Social Aspect:</i>																		12	36%				
Psychological Aspect:																								
comfy & cozy		1			1	1		1			1					1						6		
enjoyment																1						1		
mention objects as emotionally important													1			1	1	1				3		
	<i>Psychological Aspect:</i>																		10	30%				
	Total:																		33	100%				

Analysis of Question to Child: “Do you have a favourite place? Where is that favourite place?”

Data from the interviews with the children (n=27) are presented in Table 5 and Table 6. The child is asked “where is your favourite place?” In Table 4, the data is categorized into high or low level of social interaction. Privacy is considered low level of social interaction.

When asked: “Do you have a favourite place? Where is your favourite place?” about their home, 84% of the children cited a place of low social interaction (see Table 5). The most often cited place by the child was their bedroom which was mentioned 17 out of the 27 locations (63%). Following the bedroom, children mentioned the place in front of the TV and hiding places as favourite places. Some children mentioned places outside of the home. 83% of favourite places outside of the home involved a high level of social interaction, such as the municipal pool, the beach, and the amusement park. One 9 year old boy explained what was special about his home by comparing his feelings when he is in his home to when he is at other people’s homes:

(My home is special) because I live in my home. My home is where I'm used to. It's kind of creepy and stuff in other people's homes. [Why?] I don't feel like I'm at home, I miss my family so it's creepy.

One 7 year old girl mentioned her bedroom and bed as being an important component of providing comfort to her when asked what made her home special or different from other people’s homes:

My bedroom because it makes it more comfortable. Sometimes in other people's beds I feel weird. I know that there is stuff that I can use because I know where to find it. My bedroom makes me happy.

The children were asked about aspects of their home that make it “special, different or better than other people’s homes”. Table 6 shows the children’s replies to this question. 51% of their replies refer to some physical aspect of their home, such as objects or toys. If the parents were renovating the house, the children often spoke about construction materials such as stone, wood or brick. Some children spoke of special hiding spots in the home. 17% of the replies referred to the social aspect of the home as important such as being near to their family members, siblings and even pets. And finally, 31% of the children’s replies were about comfort or ownership aspects of the home. One child simply answered the question with one statement: “my house makes me feel comfortable”.

Table 6 - CHILD - Child's Favourite Place

No.	ID#	Sex/ age	CHILD Where is your favourite place?	Level of Social Interaction				Mention material object
				At home		Away from home		
				Low (alone)*	High (social)	Low (alone)	High (social)	
1	4	m/9	my secret hiding spot	1				
2	5	m/6	the zoo				1	
3	6	m/6	the playroom in the basement		1			
4	7	f/9	nothing is special in this house					
5	8	m/8	the fridge and my room	1				1
6	9	m/9	my room	1				
7	9	m/5	my room, the family room	1	1			
8	10	m/7	in front of the computer; in front of the TV	2				
9	11	m/9	my room	1				
10	11	f/7	my room, my toys, school	1	1			1
11	12	f/10	my bedroom	1				
12	12	f/7	my house					1
13	12	f/4	The beach, the pool, in front of the TV	1			2	
14	13	f/10	the couch to watch TV; the chair to use the computer; my room	3				
15	13	m/8	my room	1				
16	14	m/8	TV room; play station/game boy	2				
17	15	m/5	our livingroom - lots of fun stuff in there. Also my bedroom because there's lots of fun stuff in there too.	1	1			1
18	16	m/9	My backyard & my room	1			1	
19	16	f/6	My room	1				
20	16	f/4	Too shy to talk					
21	17	f/7	"Ma chambre" (My room)	1				
22	17	m/5	my room	1				
23	18	m/9	In this house? My room. Anywhere? La Ronde; My dad's house - the Game Cube, the pool - the whole house except the bathroom. In Vaudreuil, it's a quiet place, you don't hear the 'honk honk'. I like the big lake and the boat.	2		1	1	1
24	18	m/5	(no answer)					
25	18	f/5	my room	1				
26	19	f/6	my room; at the pool (public)	1			1	
27	20	f/7	The basement (a refinished playroom); the little secret hideout (in the basement under the stairs)	1	1			
Sub Total:				26 (84%)	5 (16%)	1 (17%)	6 (83%)	5
TOTAL:				31 (100%)		7 (100%)		5

* 'In front of the TV' and 'in front of the computer' is Privacy (Reserve).

Children interviewed n = 27 (15 male/12 female) between the ages of 4 - 10 years old.

Table 7 - CHILD - Aspects of Home for the Child

No	"Is there anything that makes your home special, different or better than other people's homes?"	Physical			Social	Psychological		Total
		Objects (incl. toys)	Physical features	Hiding spot	Social (incl. pets)	Comfort	Ownership	
1	the place in the attic that is unfinished and hidden (one of the last places in the house that has not been renovated by his parents)			1				1
2	my home is filled with toys. My friends come over. We eat.	1			1			2
3	pool, cats, a dog, computer, piano	1			1			2
4	Nothing is special about my house. Outside is not good for camping. Noisy. Just a table in the dining room. I play piano 6hours/day [not true]. Kitchen is the messiest place. Better downstairs because it's not used. We use the upstairs bathroom. The ceiling is falling down in the basement. We now have natural gas because we had a leak in the Esso tank (fuel). My room is the biggest. I share it with my sister. Mom shares everybody's room. Dad's closet is cool. I saw the access to the attic. Mom's room is the darkest in the house. The closet makes it darker. In the laundry room in the basement, clothes are all over the floor. There's a small room - it counts as a room - lots of bags and it smells in there...		1					1
5	a living room full of musical instruments	1						1
6	I like it because of my toys, swing set, tree fort (these latter two were new)	1						1
7	I live in it. I'm used to it more, it's comfortable.					1		1
8	basement is different, we will have a couch and TV, 'Mom, are we going to have a desk in the basement?'	1						1
9	air conditionaing, big back yard, TV, (playroom in) basement, a garage, a guest room	1						1
10	I like to go to other people's homes because it's different and new things - but I don't stay long, it gets boring.	1						1
11	it's my own						1	1
12	my bedroom because it makes it more comfortable sometimes in other people's beds I feel weird. I know that there is stuff that I can use because I know where to find it. My bedroom makes me happy.					1		1
13	I don't know. (kept looking to parent for answers. A bit young.)							0
14	my house makes me feel comfortable					1		1
15	Because I live in my home. My home is where I'm used to. Kind of creepy and stuff in other people's homes. [Why?] I don't feel like I'm at home, I miss my family so it's creepy.				1	1		2
16	I have a nice family				1			1
17	my toys, my bed, my dresser and my brother	1			1			2
18	Big basement, pets – that's it.		1		1			2
19	I painted it with my mother and father.						1	1
20	Too shy to talk							0

Table 6 – Aspects of Home for the Child (cont'd.)

No	"Is there anything that makes your home special, different or better than other people's homes?"	Physical			Social	Psychological		Total
		Objects (incl. toys)	Physical features	Hiding spot	Social (incl. pets)	Comfort	Ownership	
21	It's special to me. Other people's homes are different. Spoke about the construction materials that are different – tile in her house that is cool on her feet; other people have wood. My friends' houses are made of rock and wood – that's different. Sometimes the (dining room) table is different. My friends' sometimes have a long table. We have a round table.		1			1	1	3
22	(I like to be at home) because there are games at home that are different from at a friend's house...like fish. Spoke a lot about the building materials and the colours (this family was doing lots of renovation since moving since about 18 months)– the brick, interlocking brick, talked about the colours of the walls in each of the rooms in the house (there were a lot of them – big house)	1						1
23	I have a room [What's special about your room?] It's my place. It's my kingdom. I decide what I do there.			1		1	1	3
24	the beds are stuck together at my dad's house (he shares a room with his twin sister).	1						1
25	(very difficult to get child to speak - lot's of "I don't know") {Do like to be at school?} It's more fun (at home). I get to play more at home.					1		1
26	child refused to talk and participate.							0
27	Because there are lots of toys like a chalkboard, there's a bathroom down there so we don't have to run up and down the stairs; there's a fridge in the basement so we can sneak stuff out; the little secret hideout (under the basement stairs) where the bags are. I go in the basement almost every day. It's where I hide when we play hide and seek. (What makes your home a 'home'?) "Toilets and beds. If you didn't have them, it wouldn't be a home." (What makes it special diff or better than other people's homes?) It's mostly the pictures (Do you mean pictures that you draw?) friends and family (photographs) and drawings like of bunnies, hampsters, people. (Can you tell me about your home, as if I had never seen it?) pictures and books and lots of toys. Sometimes the toys remind me of the people who gave me them.	1	1	1				3
TOTAL:		11	4	3	6	7	4	35
		31%	11%	9%	17%	20%	11%	100%
		51%			17%	31%	100%	

5.4) Comments on Methods and Ethics for Research in the Home Setting

The home is a very private place. Respect for this privacy represents significant barriers to research methodologies. The challenge for the researcher is to use effective methods while respecting these ethical concerns. The very nature of home, as a primary territory, leaves investigators susceptible to being perceived as trespassers. From the very beginning of the process, the concerns of the participants must be addressed and the merits of the research should be explained clearly to them. They must believe that these merits outweigh the costs. If this initial trust is not achieved, the livelihood of the research project is at risk

An example of this sense of violation of one's home was demonstrated in the case a federally-funded study of "ghetto" households performed by Al Scheflen and his colleagues in the late 1960's (Scheflen, 1971). They were using a methodology along the lines of Roger Barker's "stream of behavior" which entailed thousands of hours of taping and coding. Cameras were placed in the homes of the participants and researchers would come in every couple of days to change the tapes. However, the participants forced an early termination of the study, claiming that it was an invasion of privacy and that the results of the study would only harm them.

This private nature of the home can be particularly challenging when deciding on appropriate research methodologies for answering questions about the manner in which a home can influence occupant well-being. It is indeed understandable that no participant would want to feel as if their home environment was "less" than the next person's, on whatever scale "less" may be. Measuring features of a person's home for research studies presents many challenges.

In this study, a convenience sample of acquaintances of the researcher was used. The fact that the author previously had some relationship with the participants facilitated the interview process. Although this can limit the number and restrict the demographic diversity of the participants, there are advantages to this method. The person being interviewed might feel more comfortable having an acquaintance enter their home. The person might also volunteer more information than if the researcher were a stranger. Furthermore, the researcher's past relationship with the interviewee might permit another level of inquiry.

Particular to the home environment, methodological and ethical concerns emerge when investigating meaningful aspects of home. One significant challenge for the researcher is gaining entrance into people's homes – into their primary territory. Understanding and consequently accepting these limitations to research on home environments is an important step towards furthering our knowledge of the meaningful aspects of home.

CHAPTER 6

CHAPTER 6 – DISCUSSION OF RESULTS

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Chapter 6 – Discussion of Results

In the previous chapter, empirical results of the interviews performed in 17 Montreal family homes were presented. Statistical analyses of measurements taken during these interviews, as well as content analysis of where the parent feels most at home, and of the child's favourite place were also presented. In this chapter, the manner in which this data supports the psychosocial dimensions of the Hierarchy of Environmental Needs as well as the hypothesis that boundary regulation is integral to achieving health-enhancing environments is discussed. The ability for both the parent and the child to regulate their personal boundaries in the home and how this process relates to their self-reported health, mood and behaviour scores will be reviewed. The IBP will be examined via the parent and the child's manner in which they manage their psychosocial habitability dimensions, such as their needs for a place for social interaction, for privacy, and to personalize their home.

6.1) Analysis of Correlations

The most significant finding of the data correlations was the relationship between the child's sense of ownership of the home (ChHomOwn) and the amount of place for their treasures (Treasures) ($p \leq .01$ for the older children; $p \leq .05$ for the younger children). At this point, it is important to point out that correlation does not necessarily mean causation, so it is not certain from this data whether the child's low sense of ownership of the home causes the child to collect lots of objects, or if the child collects lots of objects and therefore has a low sense of ownership of the home. It will be posited that the child's low sense of ownership of home might trigger their reaction to claim territory by accumulating treasures.

The data indicated that when the child had a strong sense of ownership of the home, they often did not have as much place to store their special objects. The children's special objects were mostly toys or objects that they had found and were collecting such as rocks, stickers, toilet paper rolls, and other objects. Perhaps the more secure the child felt in terms of the home belonging to them, the fewer objects that they needed. These treasures can be interpreted as an attempt to 'mark' boundaries or claim territory. By controlling their relationship with these objects or treasures, the child is trying to develop their feeling of ownership of the home. The children who had a stronger sense of ownership of the home did not have to demonstrate any physical territorial limits. They felt comfortable simply knowing that the home belonged to them.

One case in this study which had a unique relationship between the parent's regulation of their boundaries and the child's treasures, toys, and other objects is the household where the do-it-yourself parents had renovated the entire house. During the interview process with the child, the child kept asking the mother what the plans were for such-and-such a room. All the toys were put in labeled boxes in tidy stacks in the closets. The children weren't yet reading, so the labels were more for the mother to maintain order in her environment. The child had little input into where or how much stuff he could collect. Taking a measurement for the quantity of treasures in this house was problematic because, although the children had treasures, the mother was in charge of storing and retrieving these objects. The child was given no opportunity to define or mark their territory. The children did not appear to be involved in much spatial decision-making in the home. The child's answer to "whose home is this?" was direct. He pointed his head over to his mother and said without hesitation: "Hers".

Another significant finding regarding the child's sense of ownership of the home was the correlation between the degree to which the child claims ownership of the home (ChHomOwn) and the parent's mood (MoMood) ($p \leq .05$). If the parent scores high on the mood assessment (not in a low mood), the child is more likely to have a sense of ownership of the home and to say that the home is "mine" or the family's. Lower scores on the parent's mood self-assessment measurement indicate that the parent might not be as happy and this appears to be reflected in the children's feelings of ownership of their home. In this case, the child tends to say that the home belongs to someone else, such as to their parents or to the landlord. Socioeconomic factors might play into this correlation. Persons renting might be less satisfied with their financial situation and their home environment. This can be reflected in their mood. Furthermore, the older children knew quite matter-of-factly that their home did not belong to them and clearly stated that the landlord owned their home. This correlation was not significant for the younger children, who might not understand the financial aspects of home ownership. But the fact that the parents who rented their home scored lower on their mood self-assessment clearly indicates that they are not as happy as the parents who own their own homes. This dissatisfaction with their home environment is then reflected onto the children.

The third significant finding ($p \leq .05$) was the correlation between how the parent feels about the home (Momfeel) and the amount of children's art displayed in the home (Artdispl). In the family home, parents are generally responsible for the 'marking', decorating, or 'personalization' of the home, and the parent traditionally more so (Rybzynski, 1986). The results indicate that displaying the child's art is directly correlated with the parent's positive feelings about the home. In the homes without children's art displayed, the parents felt less positive about their home environment.

The relationship between feelings about home within a family is demonstrated empirically by Csikszentmihalyi & Rochberg-Halton (1981) in their study of 315 persons from intergenerational homes in the Chicago area. The results showed that when one family member says that they have a "happy", "warm" or "free" home, then all family members when interviewed separately generally expressed similar sentiments about their home environment. Furthermore, if one family member has negative or neutral feelings about their home, all family members often feel negatively about their home as well. Therefore, if one family member expresses positive feelings about their home environment, then all family members are likely to have similar feelings about their home. One can posit that if the parent is satisfied with the regulation of their boundaries in the family home, then the child will also be satisfied with their relationship to the physical home environment. Similarly, if the parent is dissatisfied with the regulation of their boundaries, then the child will also be dissatisfied.

Further establishing the link between family members about their relationship with the physical aspects of the home environment is the case of the family where the parent scored the lowest health and mood assessment. In this case, the child also had the lowest behavioral score. Every thing about the home was somehow deficient according to this child:

Nothing is special about my house. Outside is not good for camping. Noisy. Just a table in the dining room... Kitchen is the messiest place. Better downstairs because it's not used. We use the upstairs bathroom. The ceiling is falling down in the basement. We now have natural gas because we had a leak in the Esso tank (fuel). My room is the biggest. I share it with my sister. Mom shares everybody's room. Dad's closet is cool. I saw the access to the attic. Mom's room is the darkest in the house. The closet makes it darker. In the laundry room in the basement, clothes are all over the floor. There's a small room - it counts as a room - lots of bags and it smells in there...

This was the family home of the researcher's childhood friend, who felt that she had to tidy the house up for 'tour' condition before allowing the researcher to come to her home. Although the child did answer that the house was "her home", a cross-pollination of negativity appeared in this home, in terms of the child's attitude toward her space, her low behavioural score, and the parent's low mood and health score.

6.2) Analysis of Parent's Place Where They Feel most at Home

83% of the places where the parents said they felt most at home had a high level of social interaction. These places included the kitchen, living room, dining room and family room. Perhaps the importance of social places for the parent is due to their role as the person responsible for taking care of the children. Being in contact with the children is more important in order to feel at home than having a place to be alone or away from others. Only 2 of the 17 parents mentioned a private place as a place where they felt most at home. The two rooms mentioned were the bedroom and the study. Both the need for access to places for social interaction and private places are integral to the IBP in health-enhancing environments. Analysis of one question might not give enough depth into the analysis of this important dynamic relationship. Perhaps the parents could have also been asked if they would like to have more alone time, or if they enjoy being alone, or how much time do they spend with other people and how much time do they spend alone. Would they like to change this ratio of together/alone time? However, the data in this study indicates that parents prefer to be with the children in the family home. That is where they said they felt most 'at home'.

Psychological aspects were cited by the parents as important such as enjoyment, or they mentioned objects that invoke pleasant memories. Two parents mentioned the piano. The piano could be construed as a symbol of the past. Perhaps the pride of possessing the skill to play such an instrument, as well as the enjoyment associated with playing the instrument and hearing the music are important aspects of the piano. Perhaps the piano can also represent the values the parent would like to pass onto their children, such as enjoying music, and/or learning to play musical instruments, and/or having an education in artistic endeavors.

The words “comfy”, “comfortable” and “cozy” were used several times to describe why the parents felt at home in this place. One mother whose home was somewhat of a shrine to meaningful clutter could not specify an exact place where she felt most at home and wrote “my whole house is cozy and comfy” to answer where she felt most at home in the home. This woman was charismatic, confident, as well as entertaining. The walls, shelves and basically most of the flat surfaces of her house were covered by newspaper clippings, local event flyers, and the children’s school announcements. Old magazines and books stacked precariously up the sides of the stairs, photographs of family members on tables, shelves and walls, obscure musical instruments from foreign lands, varied styles of artwork and numerous other objects adorned the home. The whole house was touched by some form of personalization. The house was a shell holding everything that represented who this woman was and perhaps her family as well. She was proud of her collections. Her eclectic mix of objects in her home embodied her interests in music, travel, family and literature and thus provided a unique identity for herself, her family and her home. This woman scored high on her mood self-assessment (20) and high on her physical health self-assessment (4).

Another mother’s home was the antithesis of the former home and thus noticeably free of meaningful clutter. While sitting tranquilly at the dining room table in her immaculate home, she cited the nice view and sunlight as reasons for selecting the place where she felt most ‘at home’. The children’s toys were stored in their room in rows of identical plastic blue boxes with lids. These boxes were identified by labels printed out from a label-maker (one of the two young children was not yet reading). The husband and wife had completed major do-it-yourself renovations in the last few years, redoing every room including the heating system, plumbing, electrical work, kitchen cupboards, new windows and more. Although there were very minimal objects of ‘meaningful clutter’ in this home, it could be construed that the mother had ‘personalized’ the home by performing much of the renovation work with her own hands. Recall that personalization is defined as the manipulation of the physical environment. If personalization is a manner in which an individual manages their IBP, then traces of the renovation such as new paint, new kitchen and sanded oak floors would be personalization. In the Piagetian sense, by manipulating objects or the environment, one gains knowledge of oneself. Perhaps the renovation work symbolized this woman’s ‘marking’ of her primary territory. This mother score 20 out of 25 on her mood self-assessment and 5 out of 5 on her physical health self-assessment, both very high scores.

Although the manner in which both women hold onto (or *don't* hold onto) objects in the home is quite different, both had a sense of pride in the manner in which they had 'claimed' or 'marked' their territory. The process of 'marking' the home as primary territory was different, with one mother requiring a larger degree of personalization or 'meaningful clutter' than the other who personalized by renovating. Each individual uses the IBP differently to produce their own health-enhancing environment. Interestingly, both mothers gave themselves a high score of 20 for the Self-Assessed Mood. For these mothers' self-assessment of their physical health, the mother with low clutter gave herself a 5 (very healthy) and the mother with high clutter gave herself a 4. Although the degree of meaningful clutter was very different, both women had positive moods and considered themselves physically healthy.

Another participant in the study was the researcher's childhood friend, recently reunited after twenty-three years when the researcher recognized this mother at her children's school fair. This woman had married, had two children and was now living one street over from the researcher. Perhaps this former relationship enabled the candor in her reply to the researcher's email asking for participants:

I'm certainly interested in your study..., however it occurs to me now that my interests (in the study) are theoretical because I have given up on trying to establish order in my household. It would take me about a month to get my house into any sort of "tour" condition, though I guess that would make for interesting correlations between the state of my home and the state of my kids' emotional health. I feel like I've just 'outed' myself: "My name is ... and I am a bad homemaker, but I love my kids.

Seriously, I can't have you over with the house the way that it is, and if I were to really tidy it up, it wouldn't be a genuine reflection of the physical environment that the kids are accustomed to, though I suppose most homes go through various states of disorder and order.

This mother scored 17 on the Mood Assessment and 3 for physical health. These scores were both the lowest scores out of all the participants in this study. When the researcher came to the house, it was apparent that the mother had tidied up the house for the interview. The researcher had known the mother quite well for many years and was aware that the mother, as a young teenager, would experience feelings of inadequacy regarding her primary territory. The researcher recalls her friend avoiding having people visit her home – including her best friend. It appeared that this woman had grown up only to continue to harbor similar feelings about the space for her new family, that is to say, her home.

One mother chose not to participate in this study. At the beginning of this study, the researcher spoke with this mother whose child was in the same kindergarten class as the researcher's daughter. The mother telephoned early one morning replying to the researcher's email asking for participants. The mother was very enthusiastic to participate in this study. However, upon learning that the interview had to be conducted in her home, there was an abrupt silence on the other end of the phone. She began to stammer and apologize that this was impossible. She explained how she thinks people react to her home, "and you look like someone whose house is very neat" she stated about the researcher. She could therefore not allow the researcher to come to her home.

We just got back from our summer vacation. The bags aren't unpacked. The kids have doctors' appointments. I don't know if I will get it all done. My mother is coming to help but she is like the Harry Potter 'Screacher' when she sees my home, it's such a disaster...When I go to other people's houses that are even messier than my own, I understand how my sister must feel when she visits my house... My husband couldn't care less about the lawn... I'm going to the doctor tomorrow to see if I have ADD (Attention Deficient Disorder). I want him to prescribe Ritalin for me... (*Lowering her voice*) I'm also on anti-depressants.

These confessions on her feelings about the state of her home appeared to have been initiated by a potential visit to her home by a woman, clipboard in hand, who looked 'like her home was very neat'.

This mother was apparently ashamed of the state of her home and appeared to blame the disarray on the fact that she was possibly ADD and vulnerable to depression. She appeared insecure about her ability to maintain an acceptable level of order in her primary territory. (Who defines an 'acceptable' level of order?) She felt that her spatial 'disaster' might be seen by others as a reflection of her inability to maintain order in her life. If the home is a mirror of the self, this woman's home might be experiencing ADD and depression as well. The message this woman sent to the researcher was that her home was not good enough, which is perhaps how she felt about herself at the time of this phone conversation. This phone conversation, which lasted about 30 minutes, makes one wonder what would have been the deviation from the mean on the Parent Mood Self-Assessment if this mother *had* accepted to participate in this study. Her refusal to participate, her relationship to her home, and her fear of others seeing her home are not trivial and must be noted in this study.

6.3) Analysis of Child's Favourite Place

Interviewer: "What makes a home 'a home'?"

Child: "Beds and toilets. Without them, it wouldn't be a home."

Deanne, age 7 years

84% of the places cited by the children as their favourite place were places of low social interaction. 17 children (63%) mentioned their bedroom as their favourite place. Other favourite places included secret hiding spots such as the attic and under the stairs. The children's preference for these places draws emphasis to their need to seek privacy and solitude. Children of the ages interviewed (between 4 and 10 years old) spend a large proportion of their day under supervision in school or at after-school activities. They are rarely given the opportunity to be alone. They appear to enjoy the opportunity when they can. Their bedroom becomes a place of escape. This place allows the child the opportunity to reflect on the day's activities to make sense of the world and thus learn to understand how they fit into this world (Hart, 1979, Moore, 1986). Personal autonomy and self-evaluation are important functions of this type of privacy.

Maxine Wolfe's thorough investigation of children's perception of privacy speaks of the importance of *choice of* aloneness or interaction as an important part of a child's healthy development (Wolfe, 1978). In the present study, some children mention a place outside of the home as a favourite place. Of these places outside the home, 83% involved high level social interaction. The results of this study indicate that children appreciate the ability to experience aloneness in the home environment but also enjoy the social interaction outside the home. In agreement with Wolfe's findings, the ability *to choose* the level of aloneness or interaction appears to be an important part in the children's selection of their favourite place.

This field work demonstrates the importance that the children attribute to having the ability to regulate both their physical and social boundaries. It is the perceived control of these boundaries (IBP) that mitigates the individual's relationship with the environment. In other words, the need for the individual to have the opportunity to regulate their boundaries is integral to achieving a health-enhancing environment.

6.4) Summary of Results

The results of this field work demonstrates that the person must have a positive, as opposed to negative, relationship with their physical environment in order to experience a supportive home environment. In the hierarchy of environmental needs for a health-enhancing environment, achieving the psychosocial environmental dimensions include achieving a sense of belonging and the need to personalize were emphasized as being important needs in a supportive environment.

Csikszentmihalyi & Rochberg-Halton (1981) showed the relationship between positive feelings within family members in a home. This present study demonstrates the relationship between the perception of the individual boundary process and health, mood and behavioural scores between family members. This study also highlights the complexity of the P-E-H system, meaning that when one person feels positively about their individual boundary regulation process, then other persons sharing the physical environment are influenced about their relationship to the built environment. When a parent feels positively about their relationship to the physical home environment, as defined by the individual boundary process, the child also has a positive relationship to their built home environment. Similarly, parents interviewed with negative perception of their relationship to their home environment, generally scored low on their physical health and mood self-assessments and this negativity was generally transferred onto the children in terms of lower behavioral scores or low sense of ownership of the home.

The dynamic P-Ee relationship was also examined in terms of assessing both the parent and the child's needs for privacy and social interaction. It was found that in the home environment, the parent's place where they felt most at home was a place with a high degree of social interaction, whereas the child's favourite place was a place that provided privacy and solitude. Furthermore, this very much supports the IBP theory proposed here. Individuals must have a sense of control of both their physical and social boundaries in order to achieve a health-enhancing environment.

The results of this study confirm that other psychosocial aspects of the built environment, such as the need to personalize and the need for a place for social interaction as well as privacy, are important components to a supportive environment.

6.5) Comments on the Analysis

Further questioning and probing the parent about their “favourite place” in the home would have been helpful to gain a deeper understanding of the importance of this place to the parent. Assumptions that the parent ‘needs’ a place of high social interaction might not hold if the question were asked differently. For example, the question, “what elements of your home are important to you?” could have opened other aspects of the home as viewed from the parent’s perspective. Perhaps privacy would have been mentioned under that context. Also, the question used in this study “where in the home do you feel most ‘at home’?” might not have been satisfactory when asking about the parent’s “favourite place” in the home. In future studies on “favourite places” of the residents of a household, it would be beneficial to use these terms when interviewing the participants to verify if the parent interprets the meaning of “favourite place” and “feel most at home” to be the same.

Furthermore, how important is physical and social boundary control in a person’s feeling ‘at home’? Is this the ultimate place where one feels in control of these boundaries? The parents often cited the reason why they felt ‘at home’ as that they felt “comfy”, “comfortable” and “cozy”. These terms need to be examined further to understand the meaning that these women attribute to them. The words ‘home’ and ‘comfort’ often go together. It would be of value to investigate further the interpretation by lay persons of the definition of comfort and how this term is related to the meaning of home. A framework for analysis of the comfort paradigm in the home could be to examine levels of comfort such as physical, functional and psychological (Vischer, 2005).

Additional probing questions to the child as to why they selected their favourite place would have provided further insight into the analysis of the child’s favourite place. Such probing might lead to the discovery that the child considers their room a place of *high* social interaction. For example, is their room a place where they bring their friends when they come over to play? Why is the child’s bedroom often the child’s favourite place? Knowing the qualities that make this place important to the child would enrich the knowledge about the characteristics of a health-enhancing home environment from the child’s perspective. Further questioning into the manner in which the child uses boundaries to regulate both their physical environment as well as their social environment is needed. This would help to

validate the theoretical Individual Boundary Process (IBP) for health-enhancing environments.

Furthermore, the family home can also be composed of intergenerational units. At this point, one could suggest that other family members should be interviewed in future studies, such as the father, or grandparents. Understanding the needs of all occupants is essential to learn how the physical dwelling can influence the health and well-being of all those who occupy this space. A home should not be designed for only those who pay for it. This comes back to the foremost question one should ask before conducting any environment and behaviour research: who is the user of this space? Who will be affected by this space? In the multi-generational home, one should account for the parents, the children and all other persons in the home.

CHAPTER 7

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Chapter 7 – Conclusions and Areas for Future Research

We have had, and still have, and still need, an environmental movement. What we need now is a social environment movement to heal society in the same way we are trying to heal nature.

Gwyn (1992)

7.1) Conclusions

A review of research-based design (RBD) guidelines revealed environmental dimensions for health-enhancing environments. These habitability dimensions address the basic needs for physiological health such as shelter, safety & security; daylight and access to nature. They also address 'higher' needs for psychosocial health. At this point, it really shouldn't be necessary to use the term 'higher' in quotation marks. Health has been defined here as a complete state of physical, mental and social well-being. These dimensions are therefore not really higher needs, but an *integral part of the environmental picture that supports a complete state of health*. In this thesis, the term 'higher' was used interchangeably with 'psychosocial', but in retrospect perhaps this might have lead the reader to believe these needs to be 'extra' or 'bonus' needs. Satisfying basic needs might then be just good enough. Hopefully this is not the case. Hopefully by now the reader does not consider physiological health to be the be-all and end-all contribution from the built environment for health.

The physiological dimensions are fairly intuitive since without shelter, there really is no contribution from the built environment towards health. Without shelter, the person is wet, hot, or cold. Similarly safety & security is a well-documented environmental dimension pertaining to the health of the occupant. Less inherent might be the next dimension on the hierarchy which is the need for access to daylight and nature. Review of the RBD guidelines indicated that these needs are integral to health-enhancing environments. The importance of natural light is already acknowledged. The need for access to nature is yet as fully embraced.

Already the sustainable building paradigm is beginning to take note of the need for daylight and to some degree the need for access to nature. The US and Canadian Green Building Council give credits to building projects that meet given Indoor Environmental Quality (IEQ) requirements in the Leadership in Energy and Environmental Design (LEED) accreditation program. These include awarding credits for achieving certain measurements for the

penetration of natural light into the building as well as for measurements of the quantity and quality of the views from the windows. However, the need for the occupant to be able to have access to nature is not yet in this accreditation program. A view is not access. This is an important differentiation and this need should be recognized by the design and planning professions. The RBD guidelines repeatedly mentioned the need for the occupant to have access to the natural world. This is a contribution to E-B knowledge.

The psychosocial dimensions in the hierarchy described as privacy & social interaction; territory; personalization; status; and the meaning of home, are more difficult to grasp than the basic dimensions. Perhaps I am speaking for myself here. As an engineer, I learned that everything could be quantified and measured. If it couldn't be quantified, an engineer makes assumptions to make it measurable. Learning to understand the human being with this paradigm was initially very difficult for me. Understanding these psychosocial dimensions in the hierarchy requires acknowledging characteristics of human beings in the built environment. In this context, the person is not a static unit ready and waiting to be measured. The person is characterized by change. It is a big step to ask an engineer to accept that anything you want to understand is described by change. Things worth understanding are supposed to stay put. Perhaps it is this paradigm that has led to the assumption that building quality stops at the basic dimensions. Perhaps the psychosocial dimensions go outside of the building industry's paradigm. It is foremost to understand the characteristics that describe the person. It is this step that I consider to be the biggest step towards achieving health-enhancing environments - understanding the Person-Environment relationship for health-enhancing environments.

Once this quality of change is embraced, the next step is to understand the individual's need to control their boundaries. In this thesis, in order to achieve health-enhancing environments, the individual requires a sense of control of their physical as well as their psychosocial boundaries. When a person feels in control of these desired boundaries, then a health-enhancing environment is achieved.

Altman had used the concept of privacy as a binding process for crowding, personal space, territory, and privacy. He defined privacy as a boundary regulating process. In this thesis, a boundary regulating process for health-enhancing environments is described with many of the same characteristics as Altman's privacy theory. Here this boundary regulation by the

individual is proposed to be the process that links the habitability dimensions of privacy/social interaction; personalization; territory; status; and the meaning of home.

The meaning of home is at the apex of the hierarchy of environmental needs. Home is described here as the place where a person has the greatest sense of control of their boundaries. It is at home where the person is able to control their physical and social boundaries, as well as define their self. The link between a sense of control of one's boundaries and a healthy development of the self was explored here.

This thesis helped to highlight the importance of boundary regulation in supportive environments. The proposed framework, the reflection on the role of physical and psychosocial boundary regulation, and the importance of home as place where desired boundary control is best achieved will help to move forward theoretical thinking in the field of E-B as well as further thinking on P-E relationships. Most important, this thesis helped to address the subtle environmental crisis.

7.2) Areas for Future Research

Further research should be dedicated to the double-faceted quality of boundary regulation. The IBP includes both physical as well as psychosocial boundaries. The work presented in this thesis has shown that personalization and territoriality are integral environmental dimensions to health-enhancing environments. The need for personalization has not been given adequate consideration about its link to occupant health and well-being. Further research into the definition of personalization, the role it plays in achieving health-enhancing environments, and how it relates to occupant well-being is necessary.

The IBP might also simply be another name for territoriality. The reason why the IBP was chosen to define this boundary regulating mechanism was that the concept of territoriality appeared to be quite muddled. Further investigation into the concept of territoriality and how it ties into health-enhancing environments is in need

The meaning of home and its relevance to boundary control for health-enhancing environments should be investigated further. The concept of comfort might be helpful to analyze this relationship. Along the lines of the Habitability Framework, Vischer (2005) proposes a model for comfort which includes physical, functional, and psychological comfort. Perhaps the ability to achieve desired individual boundaries is what makes home the most comfortable.

The importance of personalization and how it relates to health-enhancing environments need to be investigated further. Personalization as defined here as the manipulation of the physical environment needs to be investigated further. The case of the mother who had done the complete renovation of her home with her husband makes one wonder about the increasing popularity of the do-it-yourself (DIY) home remodelling trend and how this relates to the occupant's sense of well-being. The appearance of Home Depot and such stores has changed the resident's relationship with their home. They can now move walls, change flooring, install a toilet, and much more. The quantity of television shows today on home remodelling has been growing exponentially over the last several years as well. What does all this mean? Can this new do-it-yourself-building trend be seen as a way in which individuals' now control their IBP? Do they have a better relationship with their homes now

than their parents had 30 years ago before Home Depot and Debby Travis? Does this new DIY trend improve habitability? These are questions that might be interesting for future research.

The increasing empowerment of home owners over their physical boundaries would be interesting to investigate within our North American culture, but it would also be interesting to consider how our approach to home remodelling (and of course boundary control) compares to other cultures. I recently spoke to a woman living in India visiting her sister here in Montreal. She was in awe when I mentioned that I liked the paint color in her sister's dining room and asked if she had done it herself. "We never do any of this sort of work where I live. You either hire someone, or you just don't do it." Just as Edward Hall investigated the "Hidden Dimension" between cultures and personal space in the early 60's, an investigation of the manner in which people in other cultures define their physical and psychosocial boundaries in their homes could improve our understanding of boundary regulation and health-enhancing environments. Are the environmental dimensions proposed here for habitability the same in other cultures?

The importance of home and its relationship to health and well-being are touched upon briefly here. Opportunities wait for those wishing to explore the concept of taking the 'meaning of home' away from home. Observing innovative workplaces such as the Googleplex with an analytical eye may help to determine if qualities of home, not just in the home, can increase habitability. The concept of 'taking home with you' and its relationship to health and well-being should be explored further.

Content analysis of the field work revealed the parent's environmental needs to be quite different from the child's. The parents tended to prefer places of high social interaction in the home, whereas the children chose places of low social interaction or private places when asked about their favourite place. These results demonstrate the importance of individual choice in boundary regulation. Thus the name *individual* boundary process. However, analysis of the data here revealed that one person's sense of control of their boundaries in the family home is reflected in another family member's sense of control of their boundaries. As in the case of the girl who perceived her home negatively and scored poorly on her behaviour score with her mother also scoring low on her self-assessed health and mood as well, I had commented that "a cross-pollination of negativity appeared in this

home". The inter-relationship of self-assessed health and sense of control of boundaries between people living together should be investigated further. Could there be such a thing as boundary control empathy?

Lastly, the positive perspective by the occupant of their environment was touched upon briefly here as influencing whether or not the individual will achieve habitability. Individuals with negative perspectives are less likely to achieve health-enhancing environments. One case described here showed a mother who refused to participate in the study who appeared to be ashamed of her home, was taking anti-depressants and on the way to the doctor to be tested for ADD. Another case was of the child who described her home quite negatively and also scored a low behaviour score. This child had a negative perspective of her home and had behaviour problems as assessed by the mother as well. Negative influences do not lead to health-enhancing environments. The P-E relationship for health-enhancing environments is described in this thesis as a positive relationship. Therefore, further investigation of a person's boundary control perspective should be made.

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APPENDICES

MEASUREMENT TOOL

I) Observer Checklist

II) Parent Checklist

1a) Parent Questionnaire

1b) Parent Mood Self-Assessment

1c) Parent Assessment of Child Behavioural Problems

III) Child Interview

B. OBSERVER CHECKLIST (Cont'd) :

 B.11) Is there a place for your child to be alone in the home?
 (ex. In the bathroom, in his/her room)

1 2 3 4 5

NO PLACE

PLACE

 B.12) If yes, what do family members think of this retreat space for
 your child?

1 2 3 4 5

DISCOURAGED

ENCOURAGED

B.13) How do you feel about your home?

1 2 3 4 5

NEGATIVE

POSITIVE

B.14) Where in your home do you feel most "at home"?

Why there?

B.15) Your annual household income is:

1	2	3	4	5
less than \$20,000	between \$20,000 and \$50,000	between \$50,000 and \$80,000	between \$80,000 and \$100,000	over \$100,000

PARENT MOOD SELF-ASSESSMENT:

"How much of the time, during the last month, have you..."

	None of the time	Rarely	Some of the time	Most of the time	All of the time
1) ...been a very nervous person?	_____	_____	_____	_____	_____
2) ...felt calm and peaceful?	_____	_____	_____	_____	_____
3) ...felt downhearted and blue?	_____	_____	_____	_____	_____
4) ...been a happy person?	_____	_____	_____	_____	_____
5) ...felt so down in the dumps that nothing could cheer you up?	_____	_____	_____	_____	_____



U. CHILD BEHAVIOUR ASSESSMENT BY PARENT:

Below are a series of descriptions of behaviour often shown by children. After each statement are three columns: 'Does not apply', 'Applies somewhat', and 'certainly applies'. Please put ONE mark for EACH statement.

No names are required and only the researcher will see this assesment, so your candid assesment is appreciated.

	Certainly applies	Applies sometimes	Applies somewhat	Usually does not apply	Does not apply
1) Very restless. Often jumping up and down	_____	_____	_____	_____	_____
2) Truant from school	_____	_____	_____	_____	_____
3) Squirmy, fidgety child	_____	_____	_____	_____	_____
4) Often destroys own or others' belongings	_____	_____	_____	_____	_____
5) Frequently fights with other children	_____	_____	_____	_____	_____
6) Not much liked by other children	_____	_____	_____	_____	_____
7) Is often worried, worries about many things	_____	_____	_____	_____	_____
8) Tends to do things on his own - rather solitary	_____	_____	_____	_____	_____
9) Irritable. Quick to 'fly off the handle'	_____	_____	_____	_____	_____
10) Often appears miserable, unhappy, tearful or distressed	_____	_____	_____	_____	_____
11) Has twitches, mannerisms or tics of the face or body	_____	_____	_____	_____	_____
12) Frequently sucks thumb or finger	_____	_____	_____	_____	_____
13) Frequently bites nails or fingers	_____	_____	_____	_____	_____
14) Tends to be absent from school for trival reasons	_____	_____	_____	_____	_____
15) Is often disobedient	_____	_____	_____	_____	_____
16) Has poor concentration or short attention span	_____	_____	_____	_____	_____
17) Is afraid of new things or new situation	_____	_____	_____	_____	_____
18) Is fussy or over-particular	_____	_____	_____	_____	_____
19) Often tells lies	_____	_____	_____	_____	_____
20) Has stolen things on one or more occasions	_____	_____	_____	_____	_____
21) Has wet or soiled self at school this year	_____	_____	_____	_____	_____
22) Often complains of pains or aches	_____	_____	_____	_____	_____
23) Has had tears on arrival at school or has refused to go into the building this year	_____	_____	_____	_____	_____
24) Has a stutter or stammer	_____	_____	_____	_____	_____
25) Has other speech difficulty	_____	_____	_____	_____	_____
26) Bullies other children	_____	_____	_____	_____	_____

E. QUESTIONS FOR THE CHILD (Researcher to ask child):

- E.1) Could you describe your home to me, as if I were someone who had never seen it? 1 2 3 4 5
 (Interviewer- if respondent describes social atmosphere, or mood but not physical description, then probe for physical description, and vice-versa.) NEGATIVE POSITIVE
 comment: _____

- E.2) Ask the child to draw a picture of inside their home. Ask them to include places & things that are important to them. 1 2 3 4 5
 (Rate child's positive response to this question) NO ENTHUSIASM LOTS OF ENTHUSIASM
 comment: _____

- E.3) Is there anything about your home that makes it special, different or better than other people's homes? 1 2 3 4 5
 (a. Rate child's positive response to this question) NO ENTHUSIASM LOTS OF ENTHUSIASM
 (b. Rate the 'connectedness' or 'relatedness' of this to the child's home) 1 2 3 4 5
 NOT RELATED VERY RELATED
 comment: _____

- E.4) Whose home is this? 1 2 3 4 5
 OTHER PERSON'S HOME MY HOME
- E.5) Do have a favourite place? Where is your favourite place? 1 2 3 4 5
 Place: _____ OUTSIDE HOME HOME
- E.6) Do you like to be at home? 1 2 3 4 5
 NO YES

END TIME: _____