Quality Assessment and Planning for Children:
Description and Measurement of the Physical Environment of Child Care Centres

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Résumé

Il est bien connu que la qualité de la prise en charge des enfants a son importance et que la qualité de l'environnement physique de cette prise en charge en est une composante essentielle. Des efforts sont actuellement faits pour développer une échelle pour la description et l'évaluation d'aspects cruciaux de l'environnement physique des centres où s'effectue la prise en charge des enfants. Ces aspects concernent la qualité et les compétences relatives à la prise en charge. L'échelle prendra aussi en compte l'emplacement, l'organisation spatiale du centre dans sa totalité, les caractéristiques des espaces individuels et les aires d'activités à l'extérieur. Cet article résume le besoin d'une telle échelle, critique d'autres échelles existantes aujourd'hui et suggère des principes pour une bonne planification des centres de prise en charge d'enfants.

Summary

It is well known that the quality of child care matters and that the physical environment of child care is an important component of quality. Efforts are underway to develop a set of scales for the quality assessment of key aspects of the physical environment of child care centres relative to quality and to developmental competencies. The scales will be comprehensive including location and site, the spatial organisation of the facility as a whole, the character of individual spaces, and outdoor activity areas. This paper summarizes the need for the scales, critiques other scales currently available, and suggests components of the new scales based on principles for the good planning of child care centres.

The Need for Scales of the Physical Environment

In the literature on child care, when the construct of "environment" is invoked, it is most often limited to the social and organisational environment (e.g., amount and quality of adult interaction with children, type of curriculum) and not the planning of

the physical environment. Quality is assessed, therefore, in terms of social and organisational variables, like caregiver style, curriculum, and materials available. To make these assessments, a number of rating scales have been developed and are in wide use. Among the best known are the Early Childhood Assessment Profiles (Abbott-Shim & Sibley, 1992), the HOME Observation for Measurement of the Environment (Caldwell & Bradley, 1982), the various Early Childhood Environment Rating Scales (Harms, Cryer, & Clifford, 1990), and the Purdue Home Stimulation Inventory (Wachs, 1990).

There are many similarities in structure and content among these scales. All have the explicit purpose of describing and evaluating different aspects of child care programs and centres. And yet despite their titles including the word "environment," all focus almost exclusively on the programmatic, social, or organisational aspects of child care. Few pay attention to the physical designed environment of child care centres.

In an earlier paper, I reviewed one of the best known and most widely used scales, the Harms *et al.* Infant/Toddler Infant Environment Rating Scale (Moore, 1994b). In that review, it was found that the scale is moderately reliable and valid. However, despite its name, only 8.8% of the items have any physical environmental content, the environmental content of some test items is confounded with behavioural use patterns, and the scale is silent on a great number of physical environmental issues now known or thought to be important in child care.

The same can be said for the other scales currently available. Each has very interesting parts, like Wachs' Purdue Scale being explicitly theory driven, and Caldwell et al.'s HOME Scale having the most impressive reliability and validity data, and each has some environmental aspects, but none is specially focused on physical environmental issues, nor includes a wide range of physical environmental subscales or items.

Early Childhood Physical Environment Observation Schedules and Rating Scales

How might such scales be expanded or modified to incorporate more physical environmental content? For instance, it should be possible not only to assess the availability of materials but also to specify something about the physical quality of the activity spaces where different types of materials might be used (e.g., the design character of a good reading area, arts and crafts area, etc.).

A research-use-only set of scales for the assessment of the physical environment of child care centres and outdoor play environments was developed and tested by our research group in the early 1980s and has recently been revised and reissued (Moore, 1994a). The scales are based on a small subset of patterns about the relation of the physical environment to cognitive behaviour developed at the Center for Architecture and Urban Planning Research (Moore, Hill, Lane, Cohen, & McGinty, 1979, 3rd ed. 1994). For example, the empirically based notion of resource-rich activity pockets was transformed into a scale for the measurement of behaviour settings in child care centres. The organisation of the space of the centre as a whole was made into another

scale for spatial organisation. These two scales, called the Early Childhood Physical Environment Scales, are each comprised of 10 items, each of which is scaled on a 5-point Likert-type scale. To round out the picture by also scaling some of the social and organisational aspects of child care centres, five different sets of scales have been developed to date:

- Early Childhood Center, Children, and Teacher Profiles
- Early Childhood Teacher Style and Dimensions of Education Rating Scales
- Early Childhood Physical Environment Scales
- Playground and Neighborhood Observation Behavior Maps
- Environment/Behavior Observation Schedule for Early Childhood Environments

The first two sets of scales measure four dimensions of teacher or caregiver style, like preference for group versus individual teaching, as well as the overall educational philosophy of the centre, like openness versus closedness of educational philosophy. The third set characterizes the two aspects of the layout and ambience of early childhood development centres described briefly above. These first three sets of scales are measures of independent social, organisational, and physical environmental variables. The final two sets of scales are behaviour maps and observation schedules used to assess dependent cognitive and social consequences of the socio-physical environment, including gender- , age- and ethnic-group mixing, degree of engagement, exploratory behaviour, social interaction, type of caregiver involvement, and type of caregiver-caregiver interaction.

The findings from studies using the above instruments suggest that the planning of outdoor play environments and child care centres leads to significant effects on a number of cognitive and social developmental variables. For example, adventure playgrounds are associated with more cognitive play while everyday neighbourhood play settings support more social play (Moore, Burger, & Katz, 1979). Controlling socio-economic differences between children and stylistic/philosophical differences between caregivers, well-defined behaviour settings and modified open plan layouts both contribute to more cognitive and social activities than either poorly defined activity settings (Moore, 1986) and then open plan facilities or self-contained classrooms (Moore, 1987). Not surprisingly, complex interactions have been found between children's socio-economic backgrounds, caregivers' philosophy of education, and the physical environment in affecting these cognitive and social behaviours.

These findings support a general Bronfenbrennerian ecological conceptualization of environment-behaviour interactions, and have been explained more specifically by reference to a Piagetian-derived interactional theory of child development and the environment (described in some detail in Moore, 1987). That is, design features can have a direct impact on development, but more often they work in ecological concert with curriculum and family systems to have an impact on development. The findings have also pointed out some of the linkages between the architecturally designed

environment and the social system of child care as they independently and in concern influence child care practice, social and cognitive behaviours, and, ultimately, child development.

Since these results have been reported, a minor revision and re-release has been made of the scales (Moore, 1994a), now in use in research applications in several places in North America (e.g., in Wachs' lab at Purdue University in the US).

Development of a New Comprehensive Physical Environmental Scale

In our child/environment research group, we are currently working to revise and extend these scales in order to develop a new, integrated set of scales for the description and evaluation of the physical environment of child care centres and related early childhood environments. These new scales are intended for use in self-assessment, monitoring, parents concerned about quality child care, formal post-occupancy evaluation, the modification or redesign of existing centres, and the design of new centres.

Over the years, we have become rather convinced that somewhere around 16 patterns are absolutely critical for the success of any centre-based child care facility (Moore, 1994b). Our new Early Childhood Physical Environment Scales will be built around those principles, each of which, like resource-rich activity pockets and modified open plan described above, will become a subscale. The 16 key principles are organized in terms of five levels of hierarchy into a cascade of principles. Space does not permit their full description here (the reader is referred to Moore et al., 1994; and Moore, 1994c).

The Neighbourhood Hub Model

1. Network of Child Care Facilities -- comprehensive area-wide program composed of family child care, group care centres, and other child and family resources.
2. Favourable Location -- in the home neighbourhood or at the workplace, ideally on the seams between neighbourhoods, with good transportation access but away from busy roads and noxious or dangerous elements, close to natural features and community resources, and a large enough site to accommodate the building and play yards.
3. Centre Size -- not larger than 60 to 75 children (25-40 is better), 9-10 m^2/child for the building, and 9-10 m^2/child for outdoor play yards, drop-offs, and set-backs.

Site

4. Positive Orientation -- orienting the building, play yards, windows, and indoor activity spaces to frame interesting views, to capture light and sun, and to create favourable microclimates by the way the building defines positive outdoor activity spaces.
5. Safe Site Circulation -- parking and service areas away from children, parents coming to and from the centre, and children's play areas.

Building Organisation

6. Village of Identifiable Houses--decomposing the building into "houses" (pavilions/modules) of 25-40 children, each house to serve mixed-age groupings, be large enough to for all the activity pockets necessary for developmentally oriented care, have its own separate entrance, immediately adjacent play yards, and identity.

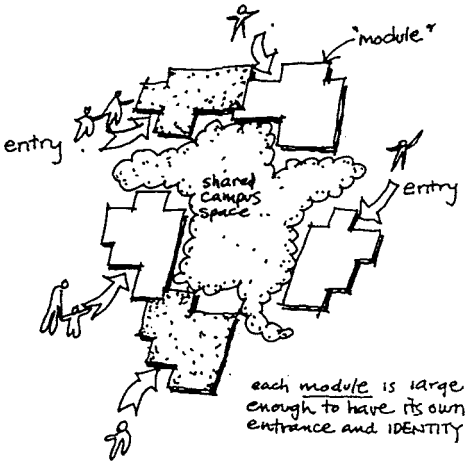

Fig. 1. A Village of Identifiable Houses -- decomposing the building into "houses," a planning concept for very large centres.

7. Building Core -- houses surrounding a central core of shared facilities: multi-purpose motor activity centre, multiuse health and social services area, and special places like a children's library, greenhouse, or animal house, as well as kitchen, staff back-stage, adult lavatories, and administration.

8. Home as a Template for Child Care -- the prevailing residential imagery of nearby houses including roof style, scale, materials, and design details, friendly-face entry sequence, vegetation and landscaping, enclosed play yards, etc., the building as a friend, soft yet exuberant.

9. Inclusiveness -- fully accessible inside and out for developmentally challenged children and adults, with flexibility of opportunities.

Houses

10. Modified Open Space -- each house spatially organized in terms of semi-enclosed/semi- open spaces, utilizing half walls, open arch ways, glazed or unglazed windows, etc. between different age-appropriate activity pockets.

11. Home Bases for 12-16 Children-at the heart of each house, where children can begin and end the day, come for lunch, potty breaks, and whenever they need a hug; each home base serves the mixed-age family groupings of the entire house, including cubbies, small kitchenette, eating cluster, intimate diapering area/learning bathroom, separate napping areas, and perhaps a quiet reading-listening area.

12. Resource-Rich Activity Pockets-a cluster of resource-rich activity pockets (primary activity spaces) for 2-5 children plus a caregiver surrounding the home base, one for each developmentally oriented activity for each age group in the house, each activity pocket with a sense of closure, but cross visibility and easily visible by staff; depending on applicable child care licensing regulations and centre philosophy, resource-rich activity pockets may be grouped by age (some for infants, toddlers, and older preschoolers), or may be age mixed.

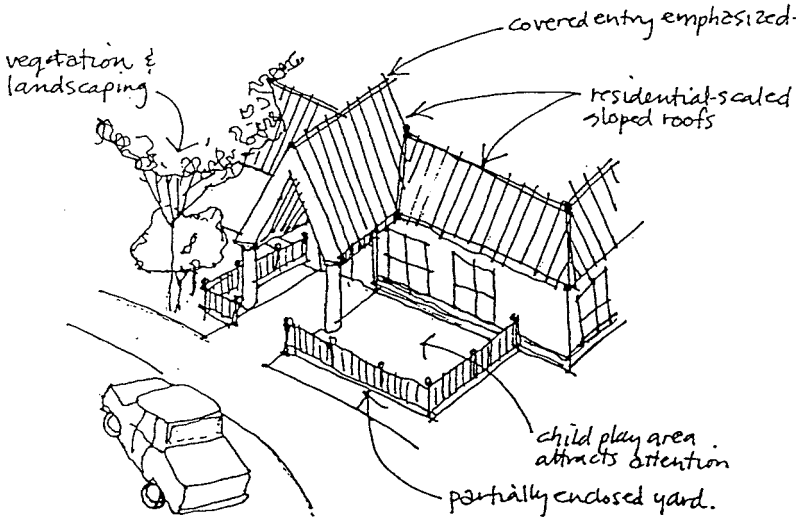

Fig. 2. The Home as a Template for Child Care -- reflecting the prevailing residential imagery of nearby houses.

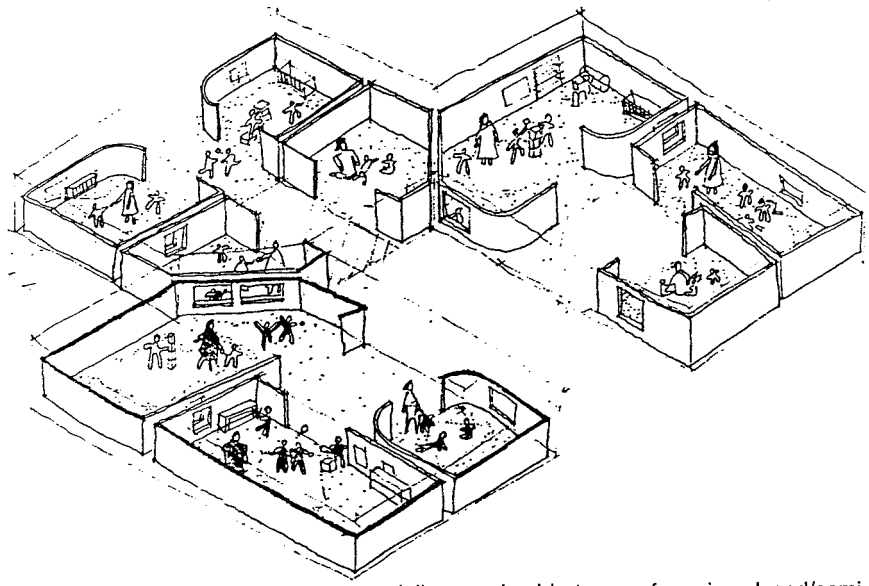

Fig. 3. Modified Open Space -- each house spatially organized in terms of semi-enclosed/semi-open spaces.

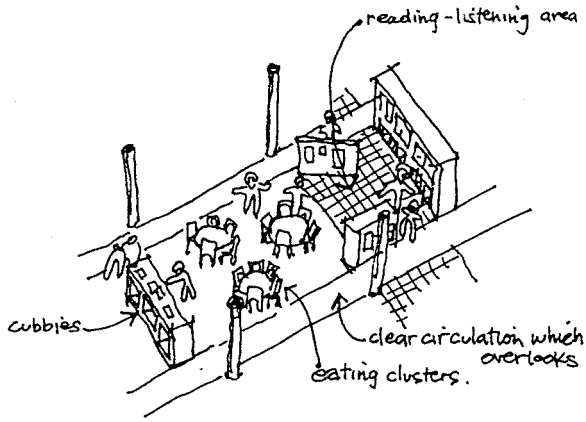

Fig. 4. Part of a Home Bases for 12-16 Children -- at the heart of each house (e.g., entry from the left, toilets and changing area on the back-side of the kitchenette on the right).

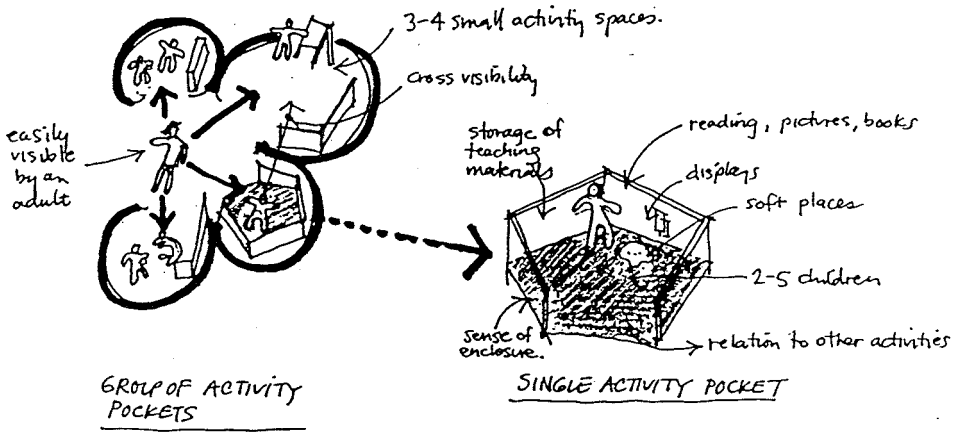

Fig. 5. Spatially well-defined Resource-Rich Activity Pockets -- a cluster of resource-rich activity pockets (primary activity spaces) for each developmental activity in the centre.

13. Spatial Zoning: Noisy/Active/Messy to Quiet/Creative/Clean--activity pockets zoned to separate noisy from quiet activities, active from creative, and messy from clean.
14. Clear Circulation Which Overlooks--each house, its home base and all of its zoned activity pockets, organized around a clear, safe circulation path; far from a corridor or hallway and far from ill-defined or ambiguous paths, clear circulation that overlooks but not interrupts activities.
15. Indoor-Outdoor Connections--wonderful visual and movement connections between in and out--low windows, wide doorways from each house, etc.

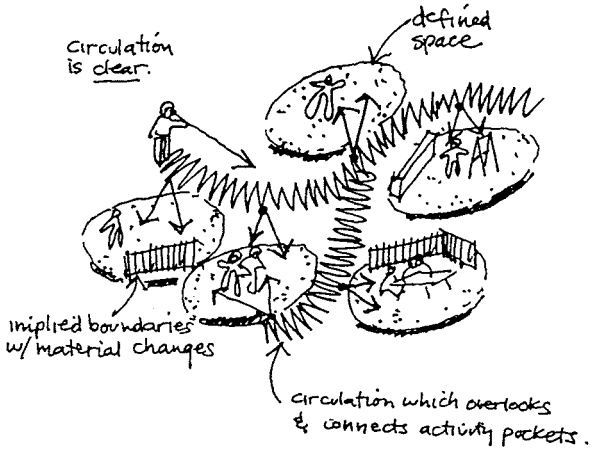

Fig. 6. Clear Circulation Which Overlooks -- each house, its home base and all of its activity pockets organized around a clear, non-interfering, safe circulation path.

Outdoor Activity Spaces

16. Developmentally Appropriate Play Yards--modelled after back yards, modified open space with resource-rich activity pockets zoned appropriately and linked by clear circulation which overlooks, the scale of typical back yards, the diversity of activities the same as inside, the same design principles as apply inside.

Many of these design principles are supported by empirical research on the relation between child development and the built environment. Others are based on studies conducted of child care centres throughout Europe and on our experience advising and working with child care centres, their directors and staff over the past 15 years in Canada and the United States. The combination of empirical research and reflective professional practice leaves us quite convinced that these design principles are absolutely critical for the success of centre-based child care centres. It follows, therefore, that they are equally important for the description and assessment of the physical environment of child care centres.

Subsequent to developing the scales, their reliability and validity will be tested on existing child care centres (two of my students have already begun this work through independent research projects), and they will be revised appropriately. We will report further on progress on the development of the new scale in subsequent papers.

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