CONTENTS

PREFACE

ACKNOWLEDGEMENTS

EDITORIAL COMMENTS & SUMMARY STATEMENT

PART 1: PAPERS

1.1 BUILDING THEORY

5 What is in a Symbol: Graphical Representations in Environmental Discourse
   Nec Teymur

13 Responsibility Theory
   Robert B. Bechtel

19 Dynamic Reciprocal Determinism: A Synthetic Transactional Model of Person-Behavior-Environment Relations
   Scott Danford

29 The Past and Future of Research on Meaning in Architecture: The Case for Architectural Theory as a Basis for Future Research
   Linda N. Groat

36 Design for Fantasy and Fantasy for Design: Using Fantasy and Dream for Creativity and Symbolism in Environmental Design
   Jusuck Koh

48 Perception Theory, Formal Aesthetics and the Basic Design Course
   Jon Lang

1.2 METHODOLOGICAL ISSUES AND THEORETICAL PERSPECTIVES

59 The Challenge of the Case Study for the Environmental Design Researcher
   Gary H. Winkel

65 Measuring Cognitive Maps: Methodological Considerations from a Cartographic Perspective
   Nathan Gale

1.3 EMPIRICAL INVESTIGATIONS

75 Factors Influencing Elderly Women's Decisions Concerning Living-Room Items During Relocation
   Mary Kalyum

84 Congregate vs. Traditional Housing for Older People: Differential Patterns of Behavior Among Residents
   Mary Ann Parris Stephens & Jennifer M. Kinney

91 Neighbor's Perception of Outdoor Spaces Surrounding Group Homes for the Developmentally Disabled Adult
   Dorothy I. Butterfield

105 Judged Appropriateness of Residential Structures in Natural and Developed Shoreland Settings
   Paul H. Gobster

113 Attributes of Urban Environments Feared by Handgun Carriers
   James R. Hassinger

120 Employee Satisfaction with the Office Environment: Evaluation of a Causal Model
   Glenn S. Ferguson

129 Way-Finding in Public Spaces: The Dallas/Fort Worth, USA Airport
   Andrew D. Seidel

PART 2: SYMPOSIUMS

141 Environmental Aesthetics in Public Spaces: Applications in Decision Making
   Jack L. Nasar

144 Environmental Aesthetics:
   Empirical Research
   Jack L. Nasar

147 Symposium: Fantasy, Imagery and Form in Design: Experiencing Process
   Joseph B. Juhasz

154 Environmental Meaning: The Problem of Contextual Fit
   Linda N. Groat
PART 3: SPECIAL EVENTS

3.1 INVITED PRESENTATIONS

182 We're Human Too: The Government as a Major Consumer of Environmental Design Research
Peggy Matchette

183 The Gender Gap: Does it Exist in Environmental Design and Research?
Ann Campbell, Doris Cole, Clare Cooper Marcus, Laurie Mutchnik Maurer, Anne Parkhurst, Rebecca L. Peterson, Susan Saegert, Leslie Kanes Weisman

188 The Spatial Competence of the Borderline Retarded
Reginald G. Golledge

198 The Ideology of Designing For the Disabled
Selwyn Goldsmith

215 Barrier Free Design for Disabled Persons - Evaluation Framework For Assessing the Quality of Accessibility in Public Buildings
Patricia Ladia Falta

3.2 EDRA SPONSORED PRESENTATIONS

225 The Writings of Donald Appleyard
Dana Cuff & Kenneth Craik

232 International Developments in Environment-Behavior-Design Research
Thomas F. Saarinen, James L. Sell & Eliza Husband

233 Planathon Report: Projecting EDRA's Future

PART 4: WORKSHOPS

237 Energy-Behavior Research: Relevance in the Reagan Era
Min Kantrowitz & Richard Wener

238 Social Engineering for Energy Conservation: Delusion or Fact?
Janet Schnorr, Dan Levi & Min Kantrowitz

239 The Relationship Between the Normalization Principle and the Design of Group Homes as Supportive Environments
Dorothy I. Butterfield

240 From Idea to Image to Event: A Communication Workshop
E.G. Bailey

241 Passive Solar Design of Essex-Dorsey Senior Citizens Center, A Question of Balances: Case Study Part I
Barbara Sandrisser

242 Barrier-Free Design Modifications: Evaluating Their Success in Everyday Use
Carolyn Norris-Baker & Mary Ann Parris Stephens

243 Hospital Design and Behavior: Research, Implementation and Evaluation Workshop #1 - Programming Research
Janet Reizenstein, Richard Olsen & Gary H. Winkel

245 Hospital Design and Behavior: Research, Implementation and Evaluation Workshop #2 - Evaluation Research
Janet Reizenstein, Richard Olsen & Gary H. Winkel

246 Designing for Personal Control in Hazards and Disasters
Christine L. Hansvick

247 Childhood City: Graffiti in the Urban Environment
Sheila Lehman

248 Children's Perceptions & Representations of Home & Neighborhood Environments
Susan Saegert & Nathan J. Maltz

249 "Through Their Eyes" Empathy and Design for Long-Term Care Facilities
Barbara L. Geddis

252 "What About Tomorrow: Three Workshops on a Theme" - Part 1 - Speculate About the Future
Paul Heath, Michael Smith & Tom Edmiston
253 "What About Tomorrow: Three Workshops on a Theme" - Part II - The Role of Design, Research and Community Development
   Paul Heath, Michael Smith & Tom Edmiston

254 "What About Tomorrow: Three Workshops on a Theme" - Part III - What Now?
   Paul Heath, Michael Smith & Tom Edmiston

255 Addressing the Efficacy of a Community Scale Energy Conservation Program Founded Upon Volunteerism
   William Boles

256 Workshop: Building Playyards for Whole Children
   Charles Burger

257 Programming and the Federal Client
   Polly Welch

258 The Business of Doing Environmental Design Research
   Polly Welch

259 Aligning the Researcher's Criteria for Knowing with the Practitioner's Need to Know
   John Archea & Andrew D. Seidel

261 Workshop on the Assessment of Public Open Spaces
   Mark Francis, Leanne Rivlin, Andrew Stone & Stephen Carr

262 Urban Environments and Altered Behavior: Crime and Fear of Crime
   James Hassinger

263 Acoustical Considerations in Environmental Design Research
   Annabel J. Cohen

264 Cognition and Environmental Use: 5 Case Studies
   Jon A. Sanford

265 Workshop on Environmental Design Issues Affecting Women: An Agenda for the Eighties
   Rebecca Peterson

266 Information Technology and Office Design
   Peter Ellis, Francis Duffy & Peter Jockusch

267 Participation in Environmental Planning, Design and Management
   Robin C. Moore

269 Workshop on Environmental Aesthetics
   Jack L. Nasar

270 Success Stories: Case Studies of Researcher-Designer-User Collaboration
   Clare Cooper Marcus

271 Information Utilization in Design and Management Decision-Making
   Janet Reizenstein

272 A Model for Workplace Research
   Nancy Cato Kates & Betty Hase

273 International Housing Research Network
   James R. Anderson & Sue Weidemann

274 Methods of Housing Evaluation: Perspectives on Alternative Techniques
   Sue Weidemann & James Anderson

276 We've Looked at Both Sides Now: A Workshop of the Dual-Educated
   Robert B. Bechtel

277 Experiment into Reality VIII
   Walter B. Kleeman, Jr.

278 State of the Art of POE: Lessons from the Florida A & M School of Architecture Competition
   Rich Wener & Edward White

PART 5: POSTERS

281 Behavioral Definitions of Public Spaces: A Study on Two University Campus Settings
   Prataap Patrose

282 Participatory Planning for More Effective Corrections Facilities
   Mark Goldman & Jay Farbstein

283 Dimensions of Social Behavior Mapped in Color
   Charlan L. Graff

284 Environmental Design Education: Changing Existing Situations into Preferred Ones
   Scott Danford
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>285</td>
<td>Influences of Images of Home in Television on Children</td>
<td>Jerome Tognoli &amp; Francine Hornberger</td>
</tr>
<tr>
<td>286</td>
<td>Environmental Art</td>
<td>C. Patrick Rowan</td>
</tr>
<tr>
<td>287</td>
<td>A Model of Factors Influencing the Residential Location of Female Householders</td>
<td>Christine C. Cook</td>
</tr>
<tr>
<td>288</td>
<td>Understanding Littering Behavior: Three Field Studies</td>
<td>Brian Blenn &amp; Perry H. Prestholdt</td>
</tr>
<tr>
<td>289</td>
<td>Packaging Housing Options Information</td>
<td>Bettye Rose Connell &amp; Nancy Baird</td>
</tr>
<tr>
<td>290</td>
<td>Community-University Integration Through Participatory Design</td>
<td>George E. Temple, IV &amp; James K. Weeks</td>
</tr>
<tr>
<td>291</td>
<td>Ecosystem: A Citizen Participation Simulation Game</td>
<td>Ronald G. Phillips, Frank W. Hyde &amp; Barbara Rose Bonanni</td>
</tr>
<tr>
<td>292</td>
<td>Impact of Environment on Social and Activity Behavior in Public Housing for the Elderly</td>
<td>Thomas O. Byerts, Tamar Heller &amp; David W. Drehner</td>
</tr>
<tr>
<td>293</td>
<td>Designer Computer Interface</td>
<td>James K. Weeks</td>
</tr>
<tr>
<td>294</td>
<td>Passive Solar Design of Essex-Dorsey Senior Center</td>
<td>Robert Dolny &amp; Barbara Sandrisser</td>
</tr>
<tr>
<td>295</td>
<td>A Contribution to a Conceptual Model for Evaluating Built Environments</td>
<td>Calvin R. Brown</td>
</tr>
<tr>
<td>296</td>
<td>Childhood City: Children's Images of Alternative Futures</td>
<td>Sheila Lehman</td>
</tr>
<tr>
<td>297</td>
<td>Problems of Urban Design in Indian Urban Development</td>
<td>Richard Seaton</td>
</tr>
<tr>
<td>301</td>
<td>A Post-Occupancy Evaluation of Port Columbus Airport: Landside Users</td>
<td>Jack L. Nasar</td>
</tr>
<tr>
<td>301</td>
<td>The Interdependency Between Teaching Approach and Architectural Setting in British Primary Schools</td>
<td>Richard Hyde</td>
</tr>
<tr>
<td>301</td>
<td>Duboce Park: A Study of the Designer-User Dynamic</td>
<td>Louise Mozingo &amp; Richard Willey</td>
</tr>
<tr>
<td>302</td>
<td>Environmental Design Correlates of Social Activity in Lounge Settings</td>
<td>David E. Campbell</td>
</tr>
<tr>
<td>302</td>
<td>Translation of Behavioral Research Into Design Solutions for Park Settings</td>
<td>Lynn Mittelstaedt Warren</td>
</tr>
<tr>
<td>302</td>
<td>Shaping School Environments for Adolescents</td>
<td>Henry Sanoff</td>
</tr>
<tr>
<td>303</td>
<td>Adolescent Health Facilities: Preliminary Results of a Study</td>
<td>Gary Miciunas</td>
</tr>
<tr>
<td>303</td>
<td>Environmental Design as Everyday Life: The Case of Preshil</td>
<td>Kimberly Doveyan</td>
</tr>
<tr>
<td>303</td>
<td>A Social Assessment of Large Systems: A Case Study of the Pierce Transit Timed Transfer City/County Bus System</td>
<td>Robin C. Moore, Daniel S. Iacofano &amp; Susan M. Goltsman</td>
</tr>
<tr>
<td>304</td>
<td>Social Risk Management: Improving Social and Cultural Appropriateness in Project Design</td>
<td>Kevin Preister</td>
</tr>
<tr>
<td>304</td>
<td>Research Techniques in Architectural Practice: Programming Through Occupancy</td>
<td>Kent F. Spreckelmeyer</td>
</tr>
<tr>
<td>304</td>
<td>Stalking the Wild Pedestrian: A Comparison of Questionnaire and Tracking Methodologies for Behavioral Mapping in Large-Scale Environments</td>
<td>Michael R. Hill</td>
</tr>
<tr>
<td>305</td>
<td>Mapping Downtown Activity: A Research Approach and Some Design Applications</td>
<td>Mark Francis &amp; Christopher Girot</td>
</tr>
</tbody>
</table>
The Role of Physical Models in Environmental Simulation
Nancy J. Volkman

Building Functions and Architecture Values
Gordon B. Simmons

Designing Through a Process of Subtraction in the Design Studio
William Douglas Cooper

Dilemmas Facing Social Scientists and Designers
Norman Pressman & Jane Tennyson

Environmental Design's Problem with Knowledge Utilization:
Information Ain't Knowledge!
Scott Danford

Dickens and Design: A Literary Perspective of the Design Process
Dana Cuff & Elizabeth Robertson

Landscape Architecture's 'Age of Aquarius'
Edward M. Schweitzer

On Religious Control and City Form
Sanjoy Mazumdar & Shampa Mazumdar

On the Nature of Japanese Green-A Question of Environmental Aesthetics
Barbara Sandrisser

A Current Japanese Response to Crowding
Naoki Kanai

Employing Socio-Cultural Factors in Environmental Design
Joan Simon & Forester Ndubisi

A Cross-Cultural Study in the Context of the Visual Access and Exposure Model
Jaepil Choi

Hierarchical Structure and Notions of 'Fuzziness' in Spatial Cognition
Larry Gorenflo

Teaching Barrier-Free Design: A Symptom, Not a Cure
Jay G. Garrott

A Theory for Evaluating Architectural Education
Kent F. Spreckelmeyer, J. William Carswell & Dennis E. Domer

The Architect in a Dialogue of Values: Creating an Image of Architectural Practice in Studio
Stefani Ledewitz

Economic and Psychological Factors in Household Energy Conservation
Shirley M. Niemeyer & Earl W. Morris

Thermal Comfort and Energy Conservation: A Case for Ceiling Fans
Frederick H. Rohles, Jr., Stephen A. Konz & Byron W. Jones

Informing Consumers of the Effects of Weatherization: Evidence of Behavioral Compensation Within Energy Systems
Jeffrey P. Mayer

Governmental Policies and Homeowner Practices with Reference to Energy Conservation
Ken McDowell

The Architectural and Public Policy Process: The Legitimate Role for Social Science
Glenn A. Stanton

The Relationship Between Environment, Morale and Length of Stay in an Institutional Setting
Janet M. Schrock

Determinants of Residential Location of Female Householders
Christine C. Cook

Stress and Adaptations of the Elderly After Relocation
Marjorie Inman & Jacqueline Duffus

Life Satisfaction and the Elderly: An Examination of Selected Housing Variables
A. William Gustafson, Cora McKown & Kenneth Hobbs

Inpatient Facilities for Hospice Programs
Marjorie Kriebel
WHAT IS IN A SYMBOL: 
GRAPHICAL REPRESENTATIONS IN ENVIRONMENTAL DISCOURSE

N Teymur

Department of Architecture
College of Art: University of Dundee
Dundee, Scotland

ABSTRACT

The increased currency of the term 'environment' (coupled with 'man') was instrumental in the constitution of a recognizable discourse which came to dominate a large number of disciplines, practices and institutions as well as the media at large. Besides words, this discourse uses a series of graphical representations which not only tend to condition the understanding of socio-spatial issues, but, by promoting a largely autonomous level of non-verbal perception and explanation, they reinforce the already strong visual bias in the architects', planners' and designers' approach to reality.

INTRODUCTION: THE RISE OF A TERM

During the 1960s and the 1970s the term 'environment' became a universally recognizable and equally ubiquitous word used in every conceivable context and with an alarming degree of obviousness. Like 'God', 'Nature' and 'World' before it, it became the common-sense of many people within or outside academic and professional circles. As a word with modest origins, in less than two decades it attained an incredible status as one of the cornerstones of academic, professional and administrative communication and as the sole object of several disciplines, sub-disciplines as well as design and planning activities, political movements and bureaucratic divisions. This common currency of the term is matched by the range of its content - in fact, it is bursting at its seams. It denotes everything:

"The unmodified term 'environment' broadly signifies any condition outside the organism, group, system, or whatever entity is being studied" (Craik, 1969, pp 13-14).

"For Fuller, environment is everything that is not man" (Jardine, 1971, p 38).

"Environment is where you live and where you work. It is intolerable housing conditions, ... It is unacceptable factories and pits and workshops all over the world. Environment is a big word and we must accept all that it means to all people. ... It leads some of our friends to campaign for world wild life, to protest against factory farming, to be vegetarian and not wear furs. Others translate their concern in demonstrating against chemical defoliation in Vietnam. ... To others environmental progress is having an indoor lavatory and being put on main drainage, or having somewhere to park their car, ..." (Labour Party, 1978, p 3).

This amazing scope, currency and popularity, however, does not necessarily imply a richness in our understanding: when a word means everything, it may, in effect, mean nothing.

What is at stake, therefore, is not simply a word, but a concept, i.e. the way in which so-called 'environmental' issues are conceived of, perceived, imagined, discussed, represented and tackled. Yet, as with all social artifacts, language and its components do not exist or operate in a vacuum. If what gives meaning to a piece of built object is its built and natural context, historical conjuncture and cultural, ideological and institutional references; what ascribes a word its power and authority is the body (or bodies) of statements and/or images within which individual words find their places. These bodies, called discourses, exist within institutional, linguistic, disciplinary or professional frameworks. The terms or concepts have to be seen in these contexts.

With such an awareness and by a method of discourse analysis especially developed for the purpose what we called 'environmental discourse' has been analysed in great detail elsewhere (Teymur, 1982). Using various semantic, textual, sociological, philosophical and graphical techniques the objects (e.g. 'man', 'environment', 'space'), structures (e.g. man-
environment relationship', conceptual couples, subject-object), mechanisms (e.g. classifications, demarcations, reductionism, psychologism, correlations, determinism, anthropomorphism), relations (e.g. between discourses, between environmental discourse and architectural and planning practices, professional ideologies, the media) and the status (e.g. the scientific claims, disciplinary standing) of the environmental discourse have been shown to constitute the bases of a complex network of arguments, belief systems, paradigms, assertions, self-images, political positions or educational programmes ...

In this complex socio-linguistic context the notion of 'environment' tends to cross boundaries, ignore differences and crop up everywhere. Yet, it is important to recognize that whether it is a housing problem, energy-conscious design, behaviour in buildings, crowding, styles or movements,

a) any one of these issues would involve several disciplines, practices, measurements and institutions, and

b) they would all be perceived from various points of view, with different objectives and interests in mind and using different tools of observation or analysis.

Whilst further diversification usually leads to a fragmentation of knowledge and understanding, generalisation is often achieved by reducing the sociological and conceptual complexity of the problem in question to a simpler framework, schema or symbol which seldom do justice to that complexity.

GRAPHICAL REPRESENTATIONS

The main objects of the environmental discourse, 'environment' and 'man', are highly problematical notions which are usually explained by metaphors and visualized by analogies. Architecture is equated with 'frozen music' (Bacon), houses with 'machines' (Le Corbusier), urban life with theatre (R Sennett, L Halprin) or the earth with 'spaceship' or mother (B Fuller, B Ward). Similarly, town-centres are referred to as 'hearts', parks as 'lungs', roads as 'arteries', slums and shanties as 'tumour' (L Kahn).

'Man' on the other hand, is said to be the 'master' or the 'centre' of the universe (that grand undefinable that is now superseded by 'environment').

The graphical representations of 'Man' and 'Environment' are as complementary to each other's existence as the words themselves are. They imply each other. In the case of 'Man', the ethnocentric, anthropocentric and anthropomorphic conceptions of social and physical world largely determine the conceptions of 'it' (not 'him') in environmental discourse. The representations of 'Man' tend to originate from the images of man that religions, cosmologies and some pseudo-theoretical ideologies assert. From an epistemological point of view, they confuse the empiricism and idealism of the subject. They talk about a 'universal essence of Man', yet conceive of 'it' in the body either of a prophet (e.g. Christ), or of a 'perfect man' with perfect measurements (e.g. Leonardo da Vinci's or Le Corbusier's drawings):

Figure 1. 'Perfect Man' by Leonardo da Vinci.

Figure 2. 'Modular Man' by Le Corbusier (1954).

Figure 3. An American poster depicting a crucified man in the midst of industrial pollution (repr. from Yanker, 1972, p 203)

In architectural designs, however, 'Man' is reduced to shadowy figures or dimensional references:

Figure 4. 'Man' and 'Women' from instant lettering.
The other half of the M-E couple, 'Environment', carries with it the burden of being everything other than men. Its representations reflect both the multiplicity inherent in its use and the singularity of its diagrammatic symbolization. Its relativistic definitions implying natural, physical, architectural, psychological, social, ... content find their corollaries in figurative mode whilst the 'surrounding' function is conveniently expressed by a circle:

In the urban and architectural contexts the variants of E are graphically related not only to M, but also to his (sic) culture, belief systems, world-views and superstitions. Pure principles and simple correlations are invoked between geometric forms of settlements or buildings and the cosmologies of their inhabitants. These then provide convenient explanatory tools to unravel the 'mysteries' of ancient forms. The presumed essence, i.e. the 'meaning', of forms and shapes are assigned the nostalgic values of 'harmony', 'coherence' or 'wholeness' (as if the contemporary urban forms were not perfectly harmonious with the type of societies in which we happened to be living in now - only that we may not be happy about it).

The graphical representations of the assumed relationship between M and E therefore superimpose the dual imagery of both M and E; that is, the universal essentialism of the ideal 'Man' and the flesh-and-blood subject of design and planning decisions; and the referential (environmental) objects and the metaphorical enclosure that 'Environment' is supposed to be: 'Man' (whatever it is) is surrounded by an 'Environment' (what-
Some of the variants of M-E relationship (e.g. interdependence, determinism, complementarity, conflict, ...) are often convincingly represented by less symbolic, but more figurative ways especially in popular media.

The second mode of representation was said to be diagrammatic. Diagrams and schemas which consist of certain geometric and symbolic notations are used to describe, demonstrate or illustrate, but also to explain, the relationship between 'Man' (or, society, culture, behaviour) and 'Environment' (or, nature, space, and if necessary, society again):

```
NATURE
/\  
MEN (→) MEN
```

Indispensable to this last type of representation are circles and connecting lines, but also arrows which not only convey, but also condition the direction of presumed relationships:

```
M → E  
E → M  
M ← E  
E ← E
```

As M is said to treat, appropriate or care about the E so is it ('he') said to construe, construct and conceive E in its ('his') head, (thus, presumably, reversing the roles and providing a mental 'environment' for the physical one, i.e. schools, homes, streets, ...).
ELEMENTS OF A CRITIQUE

Environmental discourse's reliance on non-verbal and graphical modes of representation is neither basically wrong nor is it unusual. Most types of communication use such modes and media. In fact, graphical representations are one of the tools of scientific inquiry, and as such could be considered as part of scientific discourses. Without appropriate symbols most abstract ideas and relations could not even be thought of let alone systematized into theories.

Yet it is important to realize

a) that the symbols do not have to (and ideally, should not) resemble what they symbolize, (4)

b) that the chosen symbol should not be made essential to the content of the thought (Reichenbach, 1957, p 107),

c) that a symbolic representation does not need to have a direct realistic value in ordinary experience of the phenomena in question (Bachelard, 1953, p 142), and

d) that every object may not lend itself to be represented graphically, or some may indeed require it.

Environmental discourse with its ample use of graphics but little awareness of such theoretical requirements presents many problems. First of all, most of the spatial concepts referred to in the discourse are themselves spatial. Especially in everyday discourses the concepts of the spatial objects have metaphors in space (as in the terms, such as, 'urban society', 'village life', etc). (5)

Their graphical representations, on the other hand, are also spatial, that is, they define geometric spaces, enclosures or areas. They, thus, create the conditions for the confusion of the real with its concepts or symbols. We will come back to this point later.

Parallel to the spatiality of the environ-
dence provided by the environmental problematic, their perception may be the victim of serious reductions of complexity (Teymur, 1981b, 1981a).

Finally, it would not be incorrect to suggest that the evidence for the validity of the M-E problematic is provided by the environmental discourse itself largely by means of easily visualizable circles, bubbles and arrows. To demonstrate both this tautology and also the possibilities of criticism we can briefly examine the frequently used assumptions about the properties of circle. Whether it is in geometry or in everyday context circle has a direct, realistic and experiential nature. It encloses a (two-dimensional) space and whatever else is assumed to be in that space. Each circle has a centre which is often absent, but is ascribed with several geometrical, metaphorical, cosmological or mystical meanings. Whether the circle is a graphical shape, a mathematically defined configuration or a piece of 'information' in the memory of a computer, it is both a real object and a theoretical object. Yet, the realness of a circle is itself metaphorical and representational. The line that makes it up is hypothetical and has no real thickness. This imaginary shape, however, not only defines a space within it, but through the conception of surrounding it represents another reality (i.e. 'environment') which it does not necessarily resemble. Thus, the circularity of 'space' or 'environment' is largely symbolic (probably owing to the spherical shape of the Earth!). There would be no problem here if it were not for the relativism which the legitimacy of the circular representation breeds. For example, one of the commonest uses of the circle is in the definition of demains such as 'public' and 'private', or simply 'in' and 'out', 'inside' and 'outside', 'interior' and 'exterior':

\[ \text{in} \quad \text{out} \]

Figure 24

When one goes beyond this simple level, the relativism would emerge. In a larger and less definable universe the relative positions of that which is inside and that which is said to be outside become redundant. The hypothetical boundary that defines in and out loses its determinate character:

\[ \text{in} \quad \text{out} \]

Figure 25

and as, in the new situation, either side can be the observer, perceiver or knower, an epistemology based on a 'knowing subject' ('Man') who observes and experiences the 'known object' ('Environment') that surround it collapses:

\[ \text{in} \quad \text{out} \]

Figure 26

Added to this, of course, is the relativism that besets the empiricist position in social sciences and its application in 'environmental' studies: If the basis of knowledge is what the 'subject' sees, says or experiences, what is the basis, and in fact, the object, of the scientist's knowledge?

\[ S_{\text{Scientist}} \quad M_{\text{Scientist}} \quad \text{Man} \quad \text{Society} \quad \text{M-E} \quad \text{Environment} \quad \text{Scientist} \]

Figure 27. (Teymur, 1982, p 77), (7).

Such circularities mixed with the easy symbolism of circles and centres are not simply the concerns of specialist epistemological inquiry. They find their expressions in popular (mis)conceptions about WHO does WHAT in WHAT and to WHOM in the context of everyday urban life:

"And if ECOLOGISTS are merely going to strengthen the GROUP OF EXPERTS giving advice to OTHER EXPERTS so that THEY can structure OTHER PEOPLE'S lives more effectively; i.e. interpose THEMSELVES
between the ORGANISM and its ENVIRON-
MENT, then how are WE ever going to get a
SOCIETY which is responsive to the
WORLD in which WE live? " (Ray, 1976,
> 301, capitals mine).

In order to sustain such graphically
distortionally relativistic in academic dis-
courses, and linguistic impossibilities
in popular debates, the plausibility
or the lucidity of arguments would not
be sufficient if the objective of these
debates is recognized to be more than a
choice of appropriate graphics or words.
Neither societies nor design and plan-
ing practices function with representa-
tions on paper alone. They need, and
institute, legal frameworks (property
rights), political divisions of territ-
ory (artificial borders between
countries) or physical barriers (walls,
fences, barbed wires). The stress in
this paper on the importance of dis-
course has therefore to be seen in this
context. A discourse cannot survive
without material supports such as laws,
borders or fences; nor can the latter
find their realization without the co-
operation of ideologies and discourses
such as the one we called 'environ-
mental discourse'.

The pictorial and geometric elements of
the environmental discourse that are
only briefly examined in this paper carry
with them all the problems associated
with not only those common-place shapes,
but also those with the environmental
discourse as a whole. As was already
argued, the boundaries between the
'organism' and the 'environment', or
between 'environment' and its 'outside'
are more imaginary than real (Wilden,
1972, pp 219-220; Teymur, 1982, pp
106-109, 110-117). But even in their
imaginary, symbolic and hypothetical
existence, such imaginary (conceptual)
boundaries may be the 'building blocks'
of impenetrable 'walls' between the com-
plex architectural and urban realities
and our understanding of them.

FOOTNOTES
1 I refer here to the decades that
gave us 'environmental design',
'environmental sciences', 'environ-
mental psychology', 'Faculty of the
Environment', 'Ministry of the
Environment', and, of course,
'Green' ('Environmental') ('Ecology')
Parties.
2 Most of the arguments, observations
and illustrations are in fact based
on that study.
3 'Man' represents one of the examples
of linguistic sexism in discourse not
only of everyday communication but
also of the M-E problematic.
4 N Hızır in a seminar in Ankara,
April 1968.
5 I owe this observation to B Hillier,
1975.
6 On the epistemological function of
models, see Badiou (1969).
7 A detailed examination of this point
can be found in Teymur (1982), pp 75-
82.

REFERENCES
Bachelard, G. Le Materialisme Rationnel.
Badiou, A. Le Concept de Modèle. Paris:
Maspero, 1969.
Biolat, G. Marxisme et Environnement.
Bycroft, P. The Architect's Construct:
'Schools'. Brisbane: ERDG Pty. Ltd.,
Craik, K H. Environmental Psychology.
In K H Craik, et al (Eds) New
Directions in Psychology: 4. N. York:
Critchlow, K, et al. Chartes Maze: a
model of the universe. Architectural
Association Quarterly. 1973, 5(2):
11-20.
Hindess, B. Transcendentalism and
History. Economy and Society. 1973,
2(3): 309-42.
Jaffe, A. Symbolism in the Visual Arts.
In C G Jung, et al (Eds) Man and his
Jardine, B. Me, Not Me. Architectural
Association Quarterly. 1971, 3(2):
38-40.
Labour Party. The Politics of Environ-
Le Corbusier. The Modular. London:
Faber, 1954.


Teymur, N. 'Aesthetics' of Aesthetics: aesthetic question in architectural and urban discourses. METU J. of the Faculty of Architecture, 1981(b), 7(1).


RESPONSIBILITY THEORY

Robert B. Bechtel

University of Arizona

ABSTRACT

Advances in research point to responsibility as the chief determining factor producing the positive benefits of the undermanned situation. It has been demonstrated that positive benefits occur to an individual even in an overmanned situation if the individual holds a responsible position. And cases have been found where positive benefits do not occur even though the situation is undermanned. The chief explanation for these discrepancies is responsibility and whether it is shared. Focusing on responsibility opens new vistas of research and provides a social structure for an optimal society.

INTRODUCTION

Since Roger Barker first described undermanning theory (Barker, 1960), social events and research data have accumulated to the point where re-examination of the evidence and a renaming of the theory may be in order. Social events now make the word undermanning embarrassingly sexist in connotation while it was only acceptedly sexist previously. And accumulated evidence points to a new name that more accurately locates the causal factors in the social milieu.

BACKGROUND

Barker's original thesis (Barker, 1960) was derived to explain behavioral differences between a small town in Great Britain (code-named Yoredale) and a similar town in the U.S. (code-named Midwest). It was observed that the 721 residents of Midwest sorted themselves into 579 behavior settings in order to go about their daily lives while the 1300 residents of Yoredale needed only 494 behavior settings. Thus, even though Yoredale had a higher population than Midwest, it did not have proportionately more behavior settings. In fact, judging by Midwest's standard, the average Yoredalian was .42 settings poorer by comparison.

The consequences of these disparate ratios are of central importance to psychological theory. With fewer people to sort themselves into their behavior settings, smaller organizations have to work harder. The numbers alone do not tell the story; it is the fact that fewer people have more things to do and this is felt in three major ways (Barker, 1960): 1. Since the smaller organization has fewer people but more settings proportionately, fewer people are in each behavior setting, and each setting makes a greater claim on each person, causing each person to work harder and do greater and more important work. 2. With fewer people, more forces act on each person to do a wider variety of activities, forcing them to be less sensitive to differences between themselves and others and to tolerate a lower level of maximum performance. 3. Because a wider range of forces act together their result will yield a greater importance to each person, more responsibility for each person, a greater sense of self identity, lower standards for admission to the group, greater insecurity, and more frequent instances for feedback of success or failure. These effects on the person in the small behavior setting have come to be called collectively the positive effects of undermanning. Notice, however, that the second consequence, lower level of maximum performance, and one of the third consequences, greater insecurity, (seemingly negative effects) have not held up with the evidence (Bechtel, 1977).

It is this relatively larger number of behavior settings per person that is the heart of undermanning theory. Smaller organizations tended to have more behavior settings, proportionately, per person, than did larger organizations. Barker and Gump (1964) reported an extensive study of large and small high schools in the Midwest that supported the central findings. Baird (1973) later confirmed that this relationship seemed to hold for schools throughout the nation.

The general theory as it stands with Barker's work and the Barker and Gump work (1964) and Wicker's (1969) study of churches seemed to result in the schema in Figure 1.
Large organizations produce large behavior settings which result in negative psychological benefits

Small organizations produce small behavior settings which result in positive psychological benefits

Figure 1: BASIC UNDERMANNING PREMISES

Alan Wicker and his associates produced a body of literature in support of undermanning theory. Wicker's (1969a) and Wicker and Mehler's (1971) studies support the school studies as being generalizable to churches as well. Wicker went further to include the concept of capacity into undermanning theory. Organizations do not grow and operate in a vacuum. They occupy rooms and buildings which have a physical capacity to hold only so many people. Wicker, McGrath and Armstrong (1972) defined capacity as seating capacity combined with number of meetings. The number of people available to join the organization (population supply) and thus man the settings is also critical.

Bechtel (1977) views the relationship of organization and behavior setting sizes, capacity and population supply as shown in Figure 2 (with apologies to Wicker).

Wicker (1973) goes on to expand the concept of overmanning as a definition of crowding. Overmanned behavior settings limit a person's chances of being admitted, seem to pressure for less work per person, create less of a sense of self identity, etc.

In other words, these psychological effects seem to be the opposite of those from undermanning.

Wicker feels that undermanning occurs when there are numbers of people in the behavior setting below the maintenance minimum. Maintenance minimum is the point at which the setting ceases to function, or breaks down. But this is a contradiction, because people in undermanned situations seem to function better than overmanned, and the behavior setting does not break down.

Srivastava's (1975) study of a mental hospital provided an example of undermanning in which the positive psychological benefits did not accrue. Here was an example of people in undermanned behavior settings in which the residents were so overwhelmed by duties and demands they were unable to perform. Yet, it should be noted, the behavior settings held together and did not disintegrate. What could be made of this example? The term extreme undermanning was the best possible explanation, given the evidence. The demands on the residents of the behavior settings were so many that the persons in the behavior settings could

Figure 2: SIZE OF ORGANIZATION AS RELATED TO SETTING SIZE
not respond adequately. Actually, in this instance, their own mental health was threatened.

Thus extreme undermanning and overmanning seemed to produce negative (but not necessarily the same) outcomes. This prompted Bechtel (1980) to suggest an inverted U-shaped function for undermanning, as shown in Figure 3.

In this schema for undermanning, maintenance limits occur at either end of the continuum. When extreme undermanning gets too severe, the behavior setting breaks down because the residents cannot perform their tasks. But the behavior setting also breaks apart (either into new and separate behavior settings, or a simple disintegration of the original behavior setting, or both) when the setting becomes too large. The positive benefits accrue as the behavior setting size increases (as measured by the ordinate) until maximum benefit is reached and the measures of positive benefits start decreasing toward overmanning. Note that conventional wisdom places the manning level at a point on the curve that would suggest most behavior settings could be reduced to gain more psychological benefits for nearly everyone.

This is about where the theory stands today in terms of dynamics (Holahan, 1962).

A NEW NAME SUGGESTED

Beginning with Wicker's (1968) school study, there was the suggestion that the real benefits of undermanning were not limited to small behavior settings. Wicker found that students of large schools could have the same psychological benefits of those of small schools if they were in positions of responsibility. This would seem to suggest that the benefits of undermanning come not from small numbers of people

Figure 3: EFFECTS OF UNDMANNING AND SETTING SIZE: INVERTED U-SHAPED FUNCTION
Wicker (1968) concludes (p. 260), "Thus the greater satisfaction of members of small groups may be related to their greater responsibility for and control over group output and procedures." It is not entirely clear from this whether positions of responsibility are the chief factor causing the benefits.

Willems (1967) did a study which at first may seem related to this question when he compared sense of obligation of marginal members of small schools with marginal members of larger schools. He found that "Marginal students in small schools reported as much sense of obligation as regular students while marginal students in large schools reported little, if any!" Here is a finding that seems to show the variable of smallness (however vaguely defined) seems more related to sense of obligation than positions of responsibility. However, sense of obligation, as Willems discovered, is influenced by external pressures outside the behavior setting and does not necessarily correspond with positions of responsibility within the setting. A critical test would be whether it could be demonstrated that positive benefits did not accrue when behavior settings were small and responsibility was withheld.

No experiments have been done to verify this proposition but one extensive field survey found partial evidence for such an interpretation. Curran and Stanworth (1978) studied small businesses in southern England. The 145 respondents from small businesses who were sampled should have had the positive benefits of undermanning theory. They were similar in numbers to the inhabitants of radar stations where Bechtel and Ledbetter (1976) found undermanning worked so well (less than 200 people). Yet, in most of these cases the employees complained of lack of important work and poor self identity, both associated with overmanning. They were not overwhelmed with duties so it was not a case of extreme undermanning.

Curran and Stanworth (1978) explain their findings: "The major influences were far more likely to be differences in workers' market situations and employers' selection practices that is, largely beyond workers' control. The owners of these small businesses were marginal people who were unable or unwilling to share responsibility, and the workers were people from the lowest end of the skill spectrum. The interpretation is clear: Managers did not allow the employees to share responsibility and employees were themselves not the likeliest to benefit if they did. Hence, despite the small size, no positive benefits.

Other evidence was forthcoming from the earlier cold regions studies. Bechtel and Ledbetter (1976) found lack of positive benefits under commanders of military bases who would not share responsibility. By contrast, Colarelli and Siegal (1967) found marked positive personality changes in psychiatric aides when responsibility level was increased. The benefits of job enrichment (O'Toole et al., 1973) can also be partly explained by increasing responsibility levels. In many of these cases, however, a reduction in personnel might also influence the positive results and confound an interpretation of responsibility by itself.

However, if smaller numbers are sufficient but not always necessary to explain undermanning effects, then it is time to give proper recognition to the role of responsibility and change the name from undermanning to responsibility. This would recognize that responsibility is the critical variable in the theory that produces the positive psychological benefits. At the same time it must be cautioned that small behavior settings remain the most likely place in nature where responsibility will be shared because the small numbers create pressures to do so.

Certainly, before accepting responsibility as the critical variable, contrasting groups must be tested that will separate responsibility from group size much like Wicker's 1965 study, but taking higher and lower levels of responsibility into account.

In addition, the contrasting variables
must be setting size and not confounded by organization or community size.

It is also necessary to eliminate rival hypotheses to the responsibility explanation. One rival explanation might be the frequency of contact hypothesis. Wicker (1969b) gathered evidence (although indirect) that small school students have greater frequency of contacts and exhibit more cognitive complexity. Still, another rival hypothesis would be frequency of success and failure feedback. Clearly, the separation of these rival explanations from responsibility is a complex task that lies ahead.

Another point must be made regardless of whether future research shows responsibility to be the chief variable in this theory. Undermanned, as a concept, has never been defined properly or even operationally defined as anything better than relatively smaller. In all the studies down from Barker's original thesis in 1960 through the school and church studies and up to Wicker's National Park Study, the concept has always been assumed to be evident when it could be demonstrated that one organization had relatively fewer people in their behavior settings than another. Undermanning has never been defined as too few people to fill the allotted tasks. Thus, another argument for changing the name is that the name is misleading and undefinable.

Some of the consequences of a focus on responsibility suggest new paths of inquiry. Previously, with the focus on setting size, a direct application of undermanning theory would be to deliberately structure an organization with small behavior settings. If this were done without taking into account whether the leaders of the settings were willing to share responsibility, the experiment might fail.

Still other questions need to be answered. If sharing of responsibility is a necessary component of undermanning, to what limits can this be induced in larger settings and larger organizations? Must responsibility sharing always be accompanied by a reduction in behavior setting size?

The leadership style - task interaction of the classic Lewin et al. (1939) experiment is also pertinent. Could it be that undermanning works better with only certain kinds of tasks where responsibility sharing, i.e., democratic styles, work with relatively non-productive tasks but autocratic leadership works better with highly productive tasks?

One other aspect of responsibility sharing should not be overlooked. Responsibility might be the only factor in ecological psychology that could be personality rather than behavior setting determined. Or is it? Does responsibility theory really tell us that responsibility will more likely be shared in small behavior settings rather than large ones, regardless of personality? The areas for future research are invitingly varied.

Responsibility Theory seems to point to a social structure that provides a maximum of positive benefit for both the individual and society. When responsibility is shared and not concentrated in a few, the individual feels a greater sense of self-worth and importance. Correspondingly, the individual also feels a greater obligation to his surroundings (behavior settings) and performs at a higher level. Where have we heard a better formula for an ideal society?

Footnote

1. Behavior settings are the larger-than-individual behavioral units into which people group themselves to accomplish the daily tasks of life. Most of these are the easily observable units of community life like committee meetings, grocery stores and school classes. Where two behavior patterns cannot be easily discerned, Barker invented the K-21 scale to test independence on seven dimensions (Barker, 1968).

References


DYNAMIC RECIPROCAL DETERMINISM:
A SYNTHETIC TRANSACTIONAL MODEL OF
PERSON-BEHAVIOR-ENVIRONMENT RELATIONS

Scott Danford
State University of New York at Buffalo

ABSTRACT

The marriage between Science and Design in the 1960's was based upon the promise which that relationship held for enabling knowledge-based intervention which would improve people's relationships to designed environments. To render the information which it was providing to Design comprehensible, Science initially imported individual theories from its parent disciplines - theories whose predictions, when compared against the complete, experienced reality of the person-behavior-environment relationship, proved each individually to be at least as wrong as it was right. Unwilling to accept the seeming incompatibility of those bits and pieces from these several imported theories which did evidence a degree of predictive validity, however, several authors have suggested and/or attempted synthesizing those "elements of truth" into a model (if not theory) which might enjoy more predictive success. A synthetic "dynamic reciprocal determinism" model is presented as what is meant to be a more inclusive attempt toward this end.

SCIENCE AND DESIGN

Nobel laureate Herbert Simon has written an exquisite little book titled The Sciences of the Artificial (1974) in which he distinguishes between natural sciences and artificial sciences. These sciences of the artificial concern themselves with artifacts - natural elements intentionally arranged into artificial configurations so that they might serve our purposes better than they would have in their naturally occurring arrangements. Those who devise these artificial configurations to obtain a net improvement over existing situations Simon calls "designers." Given the breadth of this definition, there are any number of professions which qualify: planning, education, medicine, law, engineering, et cetera, and, of course, architecture.

In seeking to change existing situations into preferred ones, these designers are faced with a formidable, complex task for which their traditional professional educations too often prepare them only partially (Campbell and Roark, 1972). The task of bettering the relationships between people and their designed environments demands knowledge beyond that of traditionally-defined, individual professional and/or disciplinary concerns.

This Design fully recognized as it began in the 1960's to seek an alliance with Science so that "knowledge-based interventions for the purpose of establishing and maintaining specific, preferred relationships between (people and their designed environments)" might be possible (Danford, 1982, 155-156)(Hillier, et al, 1972). What resulted was a marriage between Science and Design based upon the promise which that relationship held for enabling knowledge-based interventions which would improve people's relationships to designed environments.

Recognizing the dangers of facts without theory (Kuhn, 1962; Canter, 1970; Hillier, et al, 1972; Kaplan, 1972; Calhoun, 1973; Rapoport, 1973; Archea, 1975; Francescato, et al, 1976), the Science half of the marriage began almost immediately to import theories from its parent disciplines (Archea, 1975) in an attempt to render that information which it was providing to Design comprehensible. Unfortunately, the initial theories so borrowed proved to be largely ill-equipped to deal with the subtle, interdependent complexities involved in the design of person-behavior-environment relationships: they often focused exclusively on the individual; they tended to assume extreme, mutually exclusive positions on a variety of issues (e.g., cognition versus behavior; reductionism versus holism, et cetera) - to name but a few of the problems (Ittelson, et al, 1974).

And yet, despite their individual inadequacies when faced with the task of addressing the complete, experienced person-behavior-environment relationship (Altman, 1973; Rapoport, 1973), they each seemed to possess certain "elements of truth." Proponents could easily troop out certain limited examples where a favored theory seemed to evidence some predictive validity.
Unfortunately, none seemed to be able to withstand a full test of its predictions when compared against the reality of more varied, less carefully selected person-behavior-environment experiences. The number of confirmed predictions for each rival theory always seemed to sum to something far less than that which would be required for it to emerge as the dominant paradigm.

Based upon Kuhn's model of scientific revolution (1962), one could expect that this initial inadequacy would eventually give way as the number of confirmed predictions for one theory elevates it to a position of dominance as its discredited rivals fall. However, given the only partial successes which a number of these initially imported theories continued to achieve, one began to get the uneasy feeling that each of the theories was at least as wrong as it was right - that there was not any one of these theories anywhere near correct enough on its own to emerge as the dominant paradigm. All the theories in the running were equally flawed or inaccurate so that none could hope to offer anything even approaching a veridical representation of the person-behavior-environment reality (see Figure 1). Certainly each possessed discrete "elements of truth" (or it would not have survived so long), but each also was found grossly wanting when compared against the complete, experienced reality of the person-behavior-environment relationship (if only because each tended to ignore those "elements of truth" to be found in its rival theories) (Ittelson, et al, 1974). And yet, examination of several of those "elements of truth" (or what passes for the truth for the moment anyway) reveals what at first seems to be their fundamental incompatibility. But are they?

ELEMENTS OF TRUTH

First, it is widely accepted that there is a relatively stable, enduring relationship between behavior and environment (Proshan-sky, et al, 1970). Although few today would embrace a strict architectural/environmental determinism, that is not to say that there is no influence of environment on behavior (Wohlwill, 1973). Roger Barker (1963a, b) has demonstrated that one of the best pieces of information one could have in order to predict the behavior of a person would be that person's environmental context (i.e., behavior setting)(Willems and Campbell, 1975). Furthermore, it is recognized that this linkage between environment and behavior involves a reciprocal relationship (Steele, 1970) in that not only does environment influence behavior, but also environments can be designed to be responsive to behavioral demands as well.

Second, in the social and behavioral sciences one traditionally focuses on the person's control or influence over behavior - particularly in the more humanistic schools of thought. And yet, it is widely acknowledged that behavior can exercise a reciprocal influence on the person as well by serving, at minimum, as a feedback mechanism to the individual.

And third, there is the relationship between person and environment. That the person exerts influence over environment (Steele, 1970) - particularly the designed environment - should come as no surprise as environments today are most often of our own making. What may be less obvious is the reciprocal influence which environments exert over the person (Wicker, 1970) in quite subtle, seemingly imperceptible ways (Maslow and Mintz, 1956) - influencing moods, self-concepts, attitudes, values, expectations, perceptions, et cetera.

These generally acknowledged positions provide three elements which borrow from a number of diverse theoretical positions, and which, although potentially in conflict, are not inherently so:

1. Person - a cognizing organism (see Holland's "cognitive persuasions", 1972; see Campbell's "cognitive mediation", 1979) with previous experiences, values, expectations, anticipations, capabilities, goals, competencies, attitudes and self-concepts which cannot help but affect the behaviors exhibited (Sandahl, 1972; Honik-man, 1972) as well as the relationships to environment - particularly setting selection (Braginsky, et al, 1969; Wicker, 1970; Perin, 1972); an organism whose cognitions are undoubtedly influenced by those behaviors and environments in a reciprocal fashion as well (Mehrabian and Russell, 1974; Bandura, 1978);

2. Environment - a multifaceted (i.e., organizational, social, cultural, physical, et cetera) (Wicker, 1970; Bechtel, 1974; Gump, 1975; Moos, 1975; Rapoport, 1975; Culjat, 1976) package of discriminable stimuli (Rose, 1970) which, beyond the reciprocal relationship with the cognitive person, has well established relationships to behavior which probably include both S-R (i.e., stimulus-response)(Rose, 1970) and S-O-R (i.e., stimulus-organism-response)(see Herschberger's "internal response to internal representation", 1972; Mehrabian and Russell, 1974) contingency
elements, and

3. Behavior - purposeful (see Koh's "goal-oriented behavior", 1981), directed (see Koh's "situation-contingent behavior", 1981) action; an exclusive product of neither the cognitive person nor the contingent environment, but a simultaneous property of both to some degree (see Nahemow and Lawton's "transactional behavior", 1973; Sandahl, 1972; Brower, et al, 1976; Danford, 1978) due to the shared reciprocal relationship with each.

Over the years there have been several suggestions for and/or attempts at combining certain of these and other "elements of truth" into variously labeled synthetic models of the person-behavior-environment relationship (Wicker, 1970; Altman, 1973; Honikman, 1973; Rapoport, 1973; Studer, 1973; Willems, 1973; Archea, 1975; Moos, 1975; Wandersman, 1976; Rapoport, 1978) which it was hoped might enjoy greater predictive success when confronted with the complete, experienced reality of the person-behavior-environment relationship. Lewin's classic concept of "life space" in which behavior is seen as a function of the interaction of personality and other individual factors and the perceived environment of the individual (1951) combined several elements. Making those relationships bidirectional to reflect the reciprocal interdependencies involved (Wicker, 1970) and then adding the person-environment reciprocal relationship (Nahemow and Lawton, 1973; Pastalan, et al, 1973; Altman, 1973) moves the picture much closer to such contemporary models as Bandura's (1978) person-behavior-environment "reciprocal determinism" model (see Figure 2). Although simple reciprocal determinism does not speak to the dynamic character of the interdependent linkages involved (e.g., does not explain why or how sometimes the person seems to be the sole determinant of his/her behavior while at other times the environment seems to assume that role), and therefore remains an oversimplified representation of the complete, experienced person-behavior-environment relationship, it does provide a basic framework upon which one can expand and to which these and other "elements of truth" can be added as one moves toward the development of more inclusive synthetic models of the person-behavior-environment relationship.

**DYNAMIC RECIPROCAL DETERMINISM**

People like to think of themselves as exercising control over their behavior. Indeed, much of our society rests on the principal of individual accountability. And yet, the prospects of a person continually exerting complete, direct, purposeful, conscious control over his/her every behavior during every waking moment of the day is clearly unrealistic. The concentration and stamina required for such a continuous, second by second undertaking would demand superhuman effort. As an alternative position on the dynamics involved, it can be suggested that the person actually "monitors" (most likely subconsciously) the behavior-environment relationship (see Figure 3) (see Peterson, et al's "individual preference process", 1970; see Turan's "filtering and appraisal", 1973; see Wohlwill's "modulation of behavior", 1973; see Cohen's "perception, filtering and appraisal", 1976; see Grossbart and Amedeo's "apprehending and appraising process", 1979), adopting a relatively passive stance (i.e., as if the person's influence/factors were being held in abeyance) until such time as s/he chooses to reassert personal control by attempting to "override" the existing behavior-environment relationship (see Figure 4). "Most of the time, most people behave in ways that are compatible with or adaptive to their immediate socio-physical environment" (Wicker, 1970, 258). Only when the behavior-environment relationship evolves into a pattern substantially at variance with the person's goals, needs, values, expectations and/or capabilities might one expect such an attempt at override to occur (see Barker's "maintenance mechanisms", 1968; Wicker, 1970; see Rose's "desire for comfort", 1970; see Spivack's "critical confluence crisis", 1973; see Cohen's "coping", 1976; see Wandersman, et al's "adjustive forces", 1979).

The issues of environmental challenge and support (see Nahemow and Lawton's "environmental docility hypothesis", 1973) offer good examples. So long as the amount of challenge or support present in the "demand character" (i.e., a combination of constraints, influence and demandingness) of the environment (see Murray's "environmental press", 1938; see Moos' "environment as releaser", 1975; see Wandersman, et al's "adaptive forces, 1979) experienced by the person is compatible with his/her "environmental mastery" (i.e., a combination of skill, competence and power/clout)(see Kelly's "competency", 1972; see Nahemow and Lawton's "personal competence", 1973; see Moos' "capabilities", 1975; see Norris-Baker and Willem's "negotiability", 1979), that person could be expected to monitor that existing behavior-environment relationship and per-
mit it to continue under most circumstances (see Barker's "operating mechanism", 1968; Wicker, 1970)[see Figure 5]. However, when the amount of challenge or support present in the demand character of the environment experienced by the person is significantly at variance (see Kelly's "compatibility", 1972) with his/her environmental mastery, one might expect this violation of his/her "tolerance threshold" (i.e., the point at which one's willingness or ability to "put up with" an environmentally demanded deviation from established values, expectations, capabilities, etc., is balanced against the costs of doing something about it) to trigger an attempt to reassert control by overriding the existing "disruptive" (Wicker, 1970) behavior-environment relationship (see Figure 6). Initially this might take the form of an attempt to exert direct influence to change (i.e., redesign or replace) either the behavior (see Bell, et al's "adaptation", 1978), the environment (see Bell, et al's "adjustment", 1978), or both (Perin, 1972). Problems, of course, appear when the demand character of the environment perceived to be "inappropriate" (see Canter's "patterns of appropriateness", 1970) by the person is so strong, or the environmental mastery level of that person is so weak that the attempt to override becomes a futile exercise. Under these circumstances, the attempt to override will continue (Wicker, 1970) and, in the absence of viable environmental "escape" alternatives more suited to the person's preferred pattern of behavior, take on the appearance of inappropriate, even maladaptive behavior (see Wohlwill's "optimism function" in Nahemow and Lawton, 1973) - until, of course, the person's unsuccessful override attempts finally extinguish and the environment resumes its demanding control (a phenomenon which some gerontologist seem to view in elderly individuals as a natural process which they call "disengagement").

THE SYNTHETIC TRANSACTIONAL CONSENSUS

From the earliest days of this relationship between Science and Design, the field has been in search of theory (Parr, 1965). As part of this search, a wide variety of theoretical positions were initially imported - positions whose basic incompatibility seemed predestined by their disparate origins. And yet, over the past fifteen years, two strikingly consistent themes have surfaced among the work of those involved in this search.

The first to surface has been a call for the development of models which combine elements from these disparate, seemingly incompatible theoretical positions in recognition of the increasingly obvious argument that "no single model is complete" (Altman, 1973, 111) and that "no one model meets all needs and several models must be used - and preferably combined" (Rapoport, 1973, 124). From these early calls for the development of "synthetic" models (i.e., models which combine elements from a variety of theoretical positions into internally consistent collections more likely to evidence predictive validity), have come several attempts which have varied as to which elements were to be combined and how. Altman proposed a "social systems, ecological model" due to its usefulness "in establishing connections between the other models" (Altman, 1973, 109). Rapoport called for the synthesis of a "meta-model" (1973) and later suggested "symbolic interactionalism" (when combined with other approaches) as a basis (1978). Studer proposed a less inclusive synthesis by advocating the marriage of "behavioral technology" and "behavioral ecology" (1973). Moos responded with "social ecology" as the basis for synthesizing a number of diverse concerns and positions (1975). Wandersman proposed to combine Carl Roger's "humanism", B.F. Skinner's "behaviorism" and Walter Mischel's "social learning theory" into a single "social developmental" framework (1976).

The second theme to surface (and which is reflected in the aforementioned attempts at synthetic model development) has concerned the "transactional" nature of the person-behavior-environment relationship. Liberally interpreted, the transactional position is that behavior can only be fully understood in the context of the total person-in-environment situation (Lewin, 1964). It is a recognition that behavior is a simple property of neither the person nor the environment but is rather a function of the particular ongoing transaction between the two (Mead, 1934; Danford, 1978). Over the past fifteen years, unfortunately, the consistency of this theme in the field's search for theory has been masked somewhat by the variety of labels under which it has gone. While Nahemow and Lawton declared "all behavior is transactional - not explainable on the basis of knowledge about either the person behaving or the environment in which it occurs" (1973, 24), Altman (1973) and Willems (1973) said much the same thing but under the "ecological" and "behavioral ecology" labels respectively. Meanwhile, Mehrabian and Russell (1974), Schneekloth, et al
Figure 1 - Theories' distorted representations of Reality and their discrete "elements of truth." (above).

Figure 2 - Bandura's reciprocal determinism model.

Figure 3 - Monitoring the behavior-environment relationship.

Figure 4 - Overriding the behavior-environment relationship.

Figure 5 - Monitoring demand character in light of environmental mastery.

Figure 6 - Violation of tolerance threshold triggering override attempt.
(1978), Porteous (1978), Rapoport (1978), Grossbart and Amedeo (1979), and Jason and Smith (1980) all referenced the person-behavior-environment relationship in much the same way but in terms of "interaction" or "interactionalism." On the other hand, Moore (1976) and Wandersman, et al (1979) both employed the "transactional" label.

What the previously described "dynamic reciprocal determinism" model does is reinforce the union of these two themes by synthesizing various elements borrowed from a number of diverse theoretical positions into an internally consistent, more inclusive transactional model of the person-behavior-environment relationship. What this accomplishes is a demonstration that, semantics aside, for some time now authors from a variety of theoretical perspectives have been saying much the same thing or at least saying things which are not necessarily incompatible.

As should be obvious by the references cited in presenting this particular model, "dynamic reciprocal determinism" relies heavily upon bits and pieces from a number of previously stated theories and models. While attempting to put several traditionally rival theoretical positions in bed together in a manner which reinforces their complementarity, this model has gone to lengths to call attention to the pre-existence of virtually all of the elements around which it is built. However, while others have proposed elements akin to "demand character", "environmental mastery", "monitor", "tolerance thresholds" or "override", they either have not been as inclusive (e.g., one may refer to something akin to a cognitive "monitoring" process but not mention "demand character" or "environmental mastery") or have overlooked those elements' involvement in the dynamics of the previously described reciprocal determinism framework (including its cognizing person, multifaceted, contingent environment and transactional behavior). By attempting to synthesize all of these elements into a single, transactional-flavored reciprocal determinism framework, the proposed model hopes to bring attention to the possibility that this field may finally be on the brink of an emerging consensus among a number of those involved in this long-standing search for theory. The "prime time for paradigm" (Porteous, 1978) may finally be upon us.

AN ATTEMPT TO...

This development of a "dynamic reciprocal determinism" model which combines "elements of truth" from a number of disparate, seemingly incompatible theoretical positions is more than an attempt at an amusing exercise.

First, it is an attempt to get beyond the stagnation of a comfortable reliance on ill-fitting, borrowed theories which have little hope of producing the dominant paradigm for this field. Second, it is an attempt to capitalize on those "elements of truth" which we do possess by forcing a synthesis which might enable us to develop more inclusive transactional models which might enjoy more predictive success when confronted with the complete, experienced reality of the person-behavior-environment relationship. Third, it is an attempt to impress upon design educators the incredible range of concerns and issues which establishing and maintaining specific, preferred relationships between people and their designed environments necessarily suggests. Fourth, it is an attempt to help design professionals recognize the severe limits on their ability ever to better people's relationships with designed environments if they continue to focus their attention narrowly on architectural design interventions as their sole means of achieving that betterment in this transactional system. Fifth, it is an attempt to get the field to face up to the possibilities of intentional control of human behavior by presenting a model which defines design as devising courses of action aimed at changing existing situations into preferred ones and then implicitly suggests several arenas of influence amenable to such design. And finally, it is an attempt to stimulate more sophisticated synthetic transactional model development by serving up a rough, overly simple prototype as a sacrificial lamb to this search for theory.

Even one out of six would not be half bad.

References


Hersberger, R. Toward a Set of Semantic Scales to Measure the Meaning of Architectural Environments. In W. Mitchell (Ed.) Environmental Design: Research and Practice, Volume 1. Los Angeles: University of California, 1972, 6-4-1 to 6-4-10.

Hillier, B., Musgrove, J. and O'Sullivan, P. Knowledge and Design. In W. Mitchell


Parr, A. In Search of Theory. Arts and Architecture. 1965, 82, 14-16.


Wicker, A. Processes Which Mediate Behavior-Environment Congruence: Some


THE PAST AND FUTURE OF RESEARCH ON MEANING IN ARCHITECTURE: THE CASE FOR ARCHITECTURAL THEORY AS A BASIS FOR FUTURE RESEARCH

Linda N. Groat

Department of Architecture
University of Wisconsin-Milwaukee

ABSTRACT

The topic of meaning in architecture has, for more than 10 years, generated interest within both the fields of design research and architectural criticism; yet relatively little interdisciplinary exchange has occurred. A conceptual model is presented as a means of clarifying the different emphases which characterize each discipline's approach to the topic. Within the framework of this model, it is evident that design researchers have tended to pay scant attention to specific physical attributes of architecture (the signifier, in semiological terms) as an essential unit of analysis in the communication of meaning. It is argued that the literature on architectural criticism and theory offers an appropriate source of design research hypotheses that directly address the relationship between built form (signifier, again) and meaning. Examples of initial research based on elements of architectural theory are presented. It is argued that such research has the potential for making a substantial contribution to current architectural practice.

INTRODUCTION

For more than 10 years, the topic of meaning in architecture has generated considerable interest within both the fields of design research and architectural criticism. In both fields, the concern is similar: to understand the way in which an entire range of cognitive responses—perceptual, intellectual, emotional, etc.—are generated by exposure to built form. Given this thematic similarity and the longevity of interest in both fields, it seems quite ironic that there has been so little interdisciplinary exchange either at a theoretical or pragmatic level. Architectural professionals, including the current editor of Progressive Architecture, have noted the lack of relevant aesthetic evaluation studies generated in the design research literature (Dixon, 1979). Since "translation" is the habitual battlecry at EDRA meetings, this situation ought to be of no small concern to design researchers, and especially now because the redirection of architectural values from Modernism to Post-Modernism offers a significant opportunity for researchers to have a real impact on the future development of architecture. (Groat, 1981)

One important reason for the lack of interchange between the two sets of literatures (aside from the obvious difference between the theoretical vs. empirical emphases) is that each discipline has tended to draw from different intellectual sources. The design research literature on meaning derives, for the most part, from precedents in the social sciences, particularly Osgood's studies in psycholinguistics (Osgood et al, 1957). On the other hand, the discussion on meaning in the architectural press has tended to draw from precedents in analyses of literature and other art forms, and particularly the analytical procedures of semiotics (Saussure, 1974; Broadbent, 1977).

A number of impediments to dialogue between the disciplines obviously result from considering the topic of meaning from divergent perspectives. At its most basic level, this analysis suggests that the same ideas or concepts tend to be described by two different sets of terminology. However, though differences in terminology are a relatively superficial concern, these differences offer a clue to a far more significant disparity—the tendency of the two disciplines to focus on different constituent elements in the communication of meaning in architecture.

A CONCEPTUAL FRAMEWORK

The matrix presented in Figure 1 demonstrates that there is, in fact, general and appropriate correspondence between the concepts discussed in design research and in the literature on architectural semiotics.
Architectural Theory: Design Research:

<table>
<thead>
<tr>
<th>Units of Semiological Analysis</th>
<th>Units of Empirical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>signifier</strong></td>
<td>building or building elements</td>
</tr>
<tr>
<td><strong>signified</strong></td>
<td>dimensions, levels, constructs, etc.</td>
</tr>
<tr>
<td><strong>interpreters</strong></td>
<td>taste cultures, environmental roles, socio-economic groups</td>
</tr>
</tbody>
</table>

Figure 1 Conceptual Framework for describing Architectural Semiotics and Design Research

With reference to the lefthand column of the matrix, most architectural theorists have concentrated their attention on what is considered the fundamental concept in semiological analysis - the essential symbiosis of the signified and signifier. Generally speaking, the term signifier refers to some "material representation" (usually a building in the case of architecture); and the term signified refers to the concepts (or meanings) associated with the signifier (Broadbent, 1977). In addition, some theorists have also linked their analysis of the signifier-signified relationship to the third element of the matrix - the interpreters. For instance, Bonta (1979) has traced the changes of interpretation of Mies' Barcelona Pavilion over time.

Turning now to the righthand column of the matrix it is clear that the major focus of design research studies on meaning in architecture has had to do with--in the terms of architectural theory--either: a) the nature of the signified, OR b) differences between sets of interpreters. Included within the first category are studies that have attempted to define a common set of dimensions derived from the semantic differential technique (Canter, 1969; Collins, 1969; Vielhauer-Kasmar, 1970). The category would also include more recent studies that explore the realm of the signified through more sophisticated comparisons of response formats and statistical techniques (Horayangkura, 1978; Oostendorp & Berlyne, 1978; Ward & Russell, 1981). The second category, on the other hand, includes a variety of studies that focus on the differences in responses between different sets of interpreters, be it professional groups, socio-economic groups, nationalities, etc. (Hershberger, 1969; Leff & Deutsch, 1973; Canter et al, 1974). What seems to be missing then, are examples of design research studies that focus on the first row of the matrix: the signifier or building or building elements. Obviously, without this type of study, little information on the essential relation between signifier and signified will be generated, with the result that the relevance of design research studies to architectural theory and practice will remain limited.

ARCHITECTURAL THEORY AS A SOURCE FOR EMPIRICAL RESEARCH

This tendency in the empirical research on meaning to minimize the role of the signifier is an issue which Canter (1977) for one, has commented on. In his description of environmental research in general, he suggests that "the specification of the physical constituents of a place is a much more significant component of that place than the research literature would have one believe." Then he goes on to speculate why environmental researchers have tended to shy away from specifying relevant physical attributes.

The reason for such a dearth of studies appears to be, in part at least, the difficulty of deciding which physical attributes to study. Taken in the abstract, independently of a conceptual framework, there is an infinity of ways of dividing up and measuring physical parameters. Weight, size, colour, shape, . . . and many others, at any scale, are feasible. So researchers have either selected one which caught their fancy, with disappointing results, or given up because they were spoilt for choice. (Canter, 1977, p. 159)

And yet specifying physical attributes is the essence of an architect's--as opposed to a researcher's--job. Furthermore, whether architects acknowledge it or not (and by this time, only the most unpertinent Modernist would not), they frequently make design choices based on some vague notions about how a particular form will be interpreted, or in other words, how the signifier relates to the signified. Unfortunately, it is precisely because design researchers have...
had so little to say about what signifiers might relate to which signifieds, that they are in danger of missing the opportune moment to make a potentially significant contribution to design.

The solution is itself implied by Canter's analysis. Note that he suggests that when researchers consider physical variables abstractly, independent of any conceptual framework, they have no effective criteria for selecting the relevant physical attributes for study. And yet, the needed conceptual framework are there for any researcher willing to sift through the ever-increasing and bountiful literature on architectural theory. The wealth of theoretical debate (in the form of journals, monographs, books, and so on) which has emerged in the last five years is overwhelming. Moreover, much of it not only has bearing on the issue of meaning, but in addition this literature offers very specific ideas about how one particular building or building detail might convey one or another meaning. In many respects, these designers' assumptions and critics' analyses can be directly translated into empirical study in the form of research hypotheses.

SOME RESEARCH TOPICS BASED ON ARCHITECTURAL THEORY

The most cogent way to demonstrate the potential value of architectural theory as a basis for generating research is to cite a set of exemplary studies, some little known, and most conducted and/or published within the last five years. These examples are presented in considerable detail because they are intended to provide a source of ideas for other researchers who might choose to follow this direction in their own work. What follows therefore is a discussion of relevant empirical research organized according to 5 significant areas of contemporary architectural theory.

The five categories of architectural theory by no means exhaust the range of theoretical sources, but they do describe the scope of issues encompassed by these initial studies. For the purposes of this discussion, "architectural theory" is rather loosely defined, and it is often not theory in the strictest sense of the word. What is meant here is an entire range of concepts from ad hoc rules of thumb (design principles, really) to well-articulated justifications for a particular stylistic movement. Between those extremes are rationales for certain aesthetic predilections, design assumptions concerning specific projects, etc.

Design Principles

This category of research includes those studies which are intended to test a particular rule-of-thumb used by an architect to elicit a specified mood or response from the user or viewer. Perhaps the earliest (and likely the only) example of this type of study is one by Canter and Wools (1970) which tested the effect of three variables--furniture type, ceiling angle, and window size--on perceived friendliness. The results indicated that both furniture type and ceiling angle significantly affected the perception of room friendliness.

No other studies known to this author seem to fall into this category, however the possibilities for similar studies are virtually endless. Two articles in the architectural literature can serve as useful examples. Lyndon (1975) and Portman (1977) have each written articles which list their recommended techniques for achieving desirable architectural spaces--or place as they call it. An example of one of Lyndon's techniques follows:

Emphasize forms that relate directly to the human body and reveal its actions. Some parts of buildings are shaped directly by the human body and by its dimensions and movements. These parts are especially suggestive of people. Thick masonry walls are often hollowed into seats beneath a window, making a special place that encourages us to imagine inhabitants even when none are actually present. Stairs too, are a direct trace of human movement. Their steps represent actions. . . A house designed by William Turnbull . . . expands this principle until the stairway almost fills the house.

(Lyndon, 1975, p. 90)

This seems to constitute what is in effect one architect's design hypothesis about how people will interpret a building element; thus it is eminently suitable for empirical testing.

The Functionalist Rationale For Modernism
prevailing assumption in many design schools is as follows: "the reason there is so much 'bad' design in suburbia is because the public has very little choice" (p.11). And further, "if given a 'real choice' the lay public would prefer to have the design the trained architect can provide (p. 11).

Two recent studies have directly addressed this debate, and both researchers conclude that the homebuyers' preference for nostalgic styling and their dislike for Modernistic housing is real (Tobey, 1982; Tuttle, 1982). The one limitation of these findings is that no non-Modernist architect-designed houses were included in the set of housing being tested.

Finally, the third issue in this category—the potential of commercial strip architecture as a precedent for design—is one which has been advanced by the same architectural theorists who have argued for consideration of suburban values (Venturi et al, 1972). These authors would postulate that commonplace strip architecture is an appropriate symbol of our culture and therefore acceptable as a vocabulary of architectural form. To address this argument, Verderber and Moore (1977) compared the responses of 3 socio-economic groups to examples of high (monumental) and popular (commercial vernacular) architecture. The results indicated, contrary to what these theorists seem to presume, that all socio-economic groups tended to prefer the high architecture to the commercial vernacular.

The Rationale For Post-Modernism

This fourth category includes research that tests the design assumptions of Post-Modern buildings. Within the last 5 years or so, a number of architects and critics have argued that certain buildings are distinct from Modern buildings and can therefore be labeled Post-Modern. The supposed intentions and physical characteristics of Post-Modernism include: an attempt to communicate not only on an architectural, elite level but on a popular level as well; historicism, i.e. the use of details derived from historical styles; multivalence, which suggests that the building conveys multiple meanings without being ambiguous; the use of ornament; etc. (Jencks, 1978).

A study by the author has compared the responses of laypeople to a set of buildings which included notable examples of both Modern and Post-Modern buildings (Groat, 1982; Groat and Canter, 1979). One important finding was that non-architects displayed no consistent preferences for the Post-Modern buildings as a group, although several individual Post-Modern buildings did receive consistently high rankings. Furthermore, not one lay respondent made a distinction between the Modern and Post-Modern groups on any conceptual basis tested in the study. In other words, the physical variables associated with the Post-Modern buildings in the study did not elicit a consistent set of meanings distinct from those associated with Modern buildings.

An issue related to, though not exclusively associated with Post-Modern meaning, is that of contextual fit. Increasingly architects have voiced concern about how to achieve compatibility in situations where new buildings are inserted into older settings. Now that Post-Modernism has made ornamentation and historicism acceptable, architects are hotly debating the relative significance of various tactics (window trim detail vs. overall massing) for achieving contextual fit (Brolin, 1980). Although no studies have yet been completed on this topic, this researcher is now conducting a research project which investigates two related questions: 1) are there any identifiable design strategies which typically yield buildings that are perceived as contextually suitable? and 2) what physical variables most commonly contribute to the perception of contextual compatibility?

The Meaning of Historical Styles in Contemporary Society

This last category includes research which deals with the perceived meaning of various historical styles. In general the research question is this: does the style under investigation still convey the meanings originally intended by the designers? To date, only one study known to this author can be appropriately included in this category. The study by Espe (1981) compares the responses of both Swiss and Germans to examples of neo-Classical architecture and National Socialist Architecture, the latter being a simplified Classicism. Espe found that, even now, the stripped-down Classical vocabulary of the Nazi architecture is still perceived as being more stark and intimidating than its neo-Classical counterpart. This, of course, is precisely the effect the original architects intended.
CONCLUSION

Many architects and critics have recently offered the opinion that architecture now stands at a major turning point. The noted architect, Philip Johnson, has been quoted as saying, "We stand at a place where maybe we haven't stood for 50 years, and that is a shift in sensibility so revolutionary that it is hard to grasp" (Davis, 1978). In fact, the direction that architecture takes in the next few years may well depend on how the issue of meaning comes to be resolved. Design researchers have the potential for playing an important role in the resolution of the debate on meaning, but only if their work is linked to the theoretical and formal issues which architectural critics and practitioners see as pertinent. The intent of this paper has been to offer both a conceptual framework and a set of useful precedents for developing empirical research that is relevant to this architectural debate.

REFERENCES


ABSTRACT

In a culture where pragmatic, materialistic and positivistic attitudes prevail, fantasy and dreams are apt to be suppressed and negated, thus causing an unhealthy split in one's psyche and the alienation of people from their own selves.

Author recognizes the adaptive and existential roles that fantasy and dream play in human life and their prevalent manifestations, if frequently decadent and destructive, in today's 'ordinary' as well as 'sophisticated' culture and art works. After differentiating fantasy from dream, author articulates the conceptual linkage of fantasy and dream to symbolism and creativity. He then argues that fantasy and dreams are realities one needs to accept, conducive to enhancement of one's mental health, sense of identity and useful for releasing desire and knowledge of the inner self, which in turn helps stimulate creativity and realize the reintegration of the soul.

Citing theory and research findings in clinical and educational psychology, an attempt is made to explain why design for fantasy and dreams is necessary, and how design for fantastic and dream-like effects can be accomplished, and how the processes and images of fantasy and dream can be applied for creativity in designing and for the symbolism of the designed artifacts.

Arguing for the importance of natural, more "universal" symbolism in the global community and space age we live in, the author calls attention to the design implications of five archetypal ideas of Carl G. Jung, and suggests eight interrelated guidelines for the creation of fantastic effects in design works. He then explains why employment of fantasy and dream can enhance creativity through total consciousness and heightened sensitivity.

Ample examples exist today to illustrate how fantasy and dream are manifested in their various modes in our culture and cultural environment in general and in vernacular architecture and landscape in particular. These examples serve to point out how integral and pervasive are fantasy and dream in our lives and therefore how important it is for us to design for fantasy.

This paper will attempt to explain why we have and need to have fantasy and why certain forms have a fantasy-provoking character so that one can rationally suggest ways of designing for fantasy. It will then discuss why we need to, and how we can, incorporate fantasy into our creative problem-solving process in general and into environmental design in particular. For this purpose one needs to first briefly define fantasy and dream, explaining their nature and their adaptive role in human life, and then explain the intrinsic interrelationship they have with the creative process. The term "process" rather than "action" is chosen to be inclusive of both self-consciously compelled action and unconscious spontaneous events. The key words in this discussion are fantasy, dream, unconscious, psyche; image, symbol; creativity and design. Therefore the discussion of this paper will be advanced primarily by interrelating these core concepts.

Before we consider the literatures of psychology and psychiatry on fantasy and dream one can start with definition of fantasy as "the free play of creative imagination as it affects perception and productivity," and that of dream as "images of memories or unconscious impulse experiences during sleep" (Webster, 1966). These are simple dictionary definitions, yet they already reveal inherent implications for design, because all--fantasy, dream and design--are creative processes, and all deal with images as raw materials. They are also directed toward some ideal state, or process of idealization. They connote, as the Webster's International Dictionary indicates, the most desirable...
state or "something notable for its beauty, excellence and enjoyable quality." Thus design can be defined as "making dreams come true," to quote Coberg and Bagnal (1976), or actualizing our fantasies. However, while fantasies and dreams are normally 'spontaneous events' of the unconscious, design is a more 'purposive act' of the conscious, even if in the process one tries to reach the unconscious. Nevertheless, such is the conceptual linkage among fantasy, dream, and design. Yet one can perhaps best explain the importance and methods of designing for fantasy by explaining the nature of fantasy and the role it plays in our life, and by looking into the functional and evolutionary correlations between fantasy and design.

The terms fantasy and dream are often used more or less interchangeably (even though the latter normally occurs during sleep while the former does not) because both are known to be spontaneous happenings of a "common psychological process," the unconscious (Klinger, 1971). Both are working, as Freud thought, in the interest of "instinctual gratification," or as what Jung called "representations of the unconscious" (Jung, 1959). Through fantasy and dream we can, according to Jung, "compensate" and "complement" the shortcomings of our conscious world, and we can better understand, through listening to these "voices of nature," the totality of Self. Through them we are also known to find a productive and meaningful way to self-actualization which Abraham Maslow regarded as the motivating force of all creative human acts, (Jung, 1959; Maslow, 1954).

In fact, one can safely assert that fantasy and dream are not vanity but reality. It is a reality that we have been afraid to accept and have persistently tried to deny and disgrace for virtually five centuries, since the beginning of the Scientific Age and during so-called "Age of Enlightenment" with Descartian positivism and the Newtonian mechanistic view of Universe: the age which enlightened our conscious (a body or intellect or science) only at the cost of darkening our unconscious (a spirit or feeling or mysticism); the suppression that has more recently been reinforced by materialism, pragmatism and empiricism which dominated American minds as late as the early 1960s and the minds of many members of industrial cultures even today. Besides, fantasy encompasses a very large share of our awakened awareness, whereas directed thought and concentrated scrutiny occupy only a limited amount of time in our lives (Klinger, 1971). Man may be considered to have been first a fantasizer and only later a conceptualizer. He was first an artist, as cave paintings suggest, before he became a scientist. Our evolutionary ancestors 'thought' for more than a million years with imagery before they evolved thinking with words and numbers about 6,000 years ago. The unconscious reveals itself to us through imagery and symbols in fantasy and dream; it has therefore not disappeared but will reappear every time we relax our concentration or fall into a "mental lapse." Through symbol and imagery, our psyche expressed something that cannot be expressed in the words of the conscious mind, and likewise through symbol and imagery, rather than sign and language, our behavior, as Boulding noted and current behavioral scientists know well, is affected by our images of the environment, rather than by the environment itself (Boulding, 1956).

Unless we listen to and express this unconscious process, it is important for us to recognize that it will reveal itself anyway, either in a creative manner or in a destructive manner. Therefore, one of the most pressing reasons for the need to design for fantasy is that fantasy, if repressed, may find expression in our life and environment in a vulgar, destructive, and decadent manner (e.g. drugs, skin magazines, and X-rated movies, and "allegorical" and hedonistic designs). The question, therefore, is not whether we should design for fantasy and dream, but how can we find channels for their creative expression. In order to answer this question, it seems to be in order to understand why we have fantasy to begin with, and why ordinary people live and build the way they do, as manifested in our 'ordinary' or 'vernacular' culture and living environment.

Design for fantasy, first of all, must be considered as designing for the totality of self, rather than for the conscious ego which is known to be a fragile, limited and limiting partial self at a very early stage in its evolution. To design for the totality of self, we have to make our environment communicate not only with the conscious, cultural man, but with the unconscious, natural man. In other words, we must design not only with cultural symbols for function, structure, and economy, all of which are the concerns of the conscious world, but with 'natural symbols' from the fantasies and dreams of the more stable and conservative unconscious.
In the area of natural symbol, we have a shamefully poor record of design and research. Most of the symbolic elements we talk about today are cultural ones manifested in religions and folk arts, including those of 'vernacular' architecture. As one example, we have little understanding of why water and gardens appear so soothing and complementary in our perceptual experiences. As our society has become increasingly plural, and modern man has steadily and rapidly become alienated not only from nature but his own nature—becoming insensitive not only to processes outside one's self but to those within one's self—as the split personality and mind of the contemporary man who has lost his soul makes both individual, social and global life increasingly stressful, natural symbols can be far more effective in unifying man with his external and internal world, connecting persons with other persons, reintegrating the conscious with the unconscious, and moving people toward wholesome, healthy and stable personalities, all of which are known to be preconditions for creativity.

In applying these natural symbols, a creative interpretation of Jung's concepts of the "Collective Unconscious" and the "Archetype" could open up significant inroads to the design for fantasy and natural symbols, making our environment much more meaningful, "fanciful," and most of all, natural (Jung, 1959). This approach may prove to be far more fruitful than can the semiotic approach and some of the so-called "Post-Modern" designs that employ "historic allusion," and cultural motifs from Judeo-Christian culture and the Classic Age. (3) In other words, this approach will eventually prove to be more powerful in its fantasy-provoking impact than was the symbolist and expressionist architecture of the late 19th and 20th centuries. Because it addresses our instincts and collective unconscious, it would, creatively employed, have a far more universal and enduring effect.

Jung discussed and elaborated his idea of archetype throughout his life. Archetype, his term for "primordial image," is not some specific dream image or "content," as frequently misunderstood, but the universal trend, tendency, predisposition, or "form" in which our unconscious symbolizes, and which is shared by all mankind (Jung, 1959, 1961). Among these archetypes, some of the most notable are: Mother archetype, Child archetype, Rebirth archetype, Individuation archetype, and Anima (or Animus) archetype. Each of these archetypes has profound implications for a better understanding of the psyche and the process of maturation of the Self. For designers, they are most relevant to the designing of environmental structures that create primal, and thus universal, images that are meaningful to all mankind. Architecture inspired by this natural symbolism can be the most widely effective instigator of human fantasy and dream, connecting the external world to our internal world. This is especially true since natural symbols are not exclusive of the cultural symbol but constitute the foundation of cultural symbol. Besides, natural symbols can offer us one of the most profound ways of humanizing our environment, perhaps going far beyond the success expected by quantitative application of human scale or positivistic rather than phenomenological behavioral programming. In this limited space, I cannot elaborate upon specific implications of these archetypes at great length. However, a brief summary of these archetypes should suffice to reveal their usefulness for "meaningful" and evocative designs. Before we discuss these archetypes, let it be noted that archetypal images usually are ambivalent and have both positive and negative, creative and destructive, or "bright" and "dark" aspects. The messages one derives from them should be based upon specific situations and individual differences.

Mother archetype

The mother image is said to appear in personal dreams and cultural myth and fairy tale as: the personal mother, grandmother, stepmother, mother-in-law; any woman with whom a relation exists; goddess, the Mother of God, the Virgin Mary, Sophia, Kwan-In in Buddhism, and Shiva. It also manifests itself, Jung wrote, in "things representing the goal of our longing for redemption, paradise, the Kingdom of God," and "many things arousing devotion or feeling of awe," such as church, university, city, country, sea, water, moon. It is also related to and provoked by things and places standing for fertility and fruitfulness such as field, garden, rock, cave, tree, nature, woods, pasture, a spring, well, stillwater, sea, river; vessels, boats, and hollow objects; cow, hare and many helpful animals; house, shelter (Jung, 1959). The Moon, which symbolizes periodicity and is associated with night, is said to be also related to Mother.
water, the source and essential necessity of life, and the sea, the original birthplace of life, are related to the unconscious and the mother image.

The qualities associated with this image include maternal solicitude and sympathy, the magic authority of female, the wisdom and impulse, all that cherishes and sustains, fosters growth and fertility; place of magic transformation and rebirth; and receptivity and bounty (Jung, 1959). The sense of protection and sheltering in the incubating womb can be then associated with the female image of house. When English common law says that one's house is one's castle, it implies protection and insulation rather than a display of power and wealth.

Experienced speculators know a house built with "masculine image" with stark, modern and "less is more" doctrine, does not sell well. This is why we like the garden, tree and stone in our house, admire water and sea (place of origin of all life forms), why a park and countryside is so complementary to city and attractive to urban dwellers, why we say "mother nature" and "mother earth," why river is referred to as she, and why a home in Chinese letter means a house with a garden.

Child archetype

The child motif represents the "pre-conscious" childhood aspect of the collective psyche in which the personality is in the form of unity, i.e., wholesome personality in which there is an unconscious identity of man with the universe (Jung, 1959). Jung said each human being has originally a "feeling of wholeness, a powerful and complete sense of the Self" (Henderson, 1961). An essential aspect of the child image is its "futurity"; the child is seen to "represent the strongest, the most ineluctable urge in every being, namely the urge to realize itself" (Jung, 1959). One can conceptualize the child as undifferentiated whole, the youth as differentiated non-whole, the mature as differentiated whole. The childhood image is then related to our instinctual yearning toward the state of wholeness, "complete synthesis of personality," where there is no anxiety caused by disintegration or separation. It represents a stage in an individual's life when total bliss comes from total integration and protection, when life is filled with hope for the future. This unconscious unity of the child may be comparable to the preconscious state of Adam and Eve in the garden of Eden, before they separated from "paradise" by becoming conscious of self.

While the implication of the child archetype for the design of environmental structures is not wholly clear, one can perhaps relate it to the desirable wholeness of a building and the integration of a building not only with its inner function but with the external environment. It may also be related to the desirability of structural adaptability to growth, emphasis on open ended design, where the act of designing is not strictly dictated a priori with a predetermined goal. Play, especially children's play, has its meaning in its process rather than in the outcome. The yearning for childhood can also be interpreted as an impulse to be whimsical, spontaneous, intuitive and free from the rules, conventions, manners, pretentions and formality of the adult world.

Rebirth archetype

Jung differentiated five forms of rebirth motifs in religion, myth, and folklore: (1) "metempsychosis" (transmigration of soul, continuity of "karma"), (2) reincarnation (continuity of personality), (3) resurrection (transmutation), (4) rebirth (born again) and (5) participation in the process of transformation (June, 1959).

The Rebirth image is related to fire and the phoenix, which symbolize transformation. This seems to explain our fondness of fireplaces, and romanticism associated with campfires. Can this be the reason why, even today, the house with a fireplace remains popular when it no longer serves utilitarian purposes? Rebirth also symbolizes continuity of life and promise of freedom from death, this by separating soul from body (parallel to the separation of gene information from organic matter). In dream, myth and fairytale, this archetype also emerges in such contents as life-after-death, conquering through submission, and transcending by sacrifice, a theme that appears in all the major religions of the world.

Individuation archetype

Individuation points to a "slow imperceptible process of psychic growth" which
is a natural, involuntary process. As
the individuation process results in a
unique, singular personality, the real-
ization of uniqueness in an individual
person is said to be the goal (or better
an end result) of the process of individ-
uation (Von Franz, 1961). It is the
process by which a person becomes a psy-
chological individual, this is a separate,
dividible unity or whole (Jung, 1959).
It is, a process toward reintegration
after temporary differentiation such as
through individual growth from childhood,
which is characterized by undifferen-
tiated wholeness. The ultimate accom-
plishment of the individual, the be-
coming of the Self, is symbolized by the
mandala, and the process toward that acc-
plishment involves another archetype,
the archetype of transformation and ini-
tiation (Jung, 1959). There are four
phases in this process of individuation:
(1) attachment to mother, parental pro-
tection and mother nature; (2) recog-
nition of sexuality, involving separation
from mother (the stress of this separa-
tion is expressed in the hero myth); (3)
submission to and release of instinct;
and, (4) wholesome reintegration.
Through this process the ego achieves
"relative autonomy" from the original
condition of wholeness and from the "de-
vouring" aspect of the mother image. And
not until this is accomplished can a man
achieve his true 'relatedness' -- which
is the root meaning of Eros--to woman.
The dragon is an example of the symbolic
image of the devouring aspect of attach-
ment to mother, and the courageous
killing of it by the hero symbolizes
separation (Henderson, 1961). The man-
dala is a state of ultimate synthesis
and reintegration, synthesis of the un-
conscious of the child into the conscious
of the youth, and the union of all oppo-
sites--rational and irrational, mascu-
linity and femininity, the creative and
the destructive impulses, Logos (know-
ledge) and Eros (relatedness), and "Li"
(Organization) and "Chi" (Energy). It
is, Jung says, "embedded between Yang and
Yin; heaven and earth; the state of ever-
lasting balance and immutable duration."
It is a symbol of the "self as the psy-
chic totality" with all the necessary
inner reconciliation and wholeness (Jung,
1959). As Koestler notes, "the cliche
about unity-in-variety represents one
of most powerful archetypes of human ex-
perience--cosmos arising out of chaos"
(Koestler, 1964). The mandala thus
generates a sense of peace after the re-
solution of polarity and conflict, sense
of being natural, at one with self: one-
in-all, all-in-one; male-in-female, fe-
male-in-male; Yang-in-Yin and Yin-in-
Yang; Life-in-Death and Death-in-life.

Every building, sacred and secular, that
has a mandala-like ground plan (e.g.,
Villa Rotunda) is the "projection" of
this individuation archetype from within
the unconscious onto the outer world.
Thus the city, the fortress and the
temple become the "symbols of psychic
wholeness, and in this way exercise a
specific influence on human beings who
enter or live in the place (Jaffe, 1961).
The Greek cross, also a symbol of per-
fection, was an indirectly implied man-
dala up to Carolingian times. Thus the
Latin cross is interpreted as a "symbol
of the tendency to remove the center of
man and his faith and to 'elevate' it
into the spiritual sphere." The Renais-
sance replacement of the Latin cross in
the plan of the church with the circle,
according to Jaffe, is, however, to be
attributed to classical aesthetic reasons,
not to religious causes (e.g., Pantheon
if not St. Peter's Cathedral), because
the center of these round churches, the
truly holy place, is empty, and because
the Renaissance was also the beginning of
dualism, the split of aesthetic formalism
from symbolic formalism and the separa-
tion of beauty from meaning (Jaffe,
1961).

Today the circle is no longer a single
dominant figure that embraces a whole
world and dominates the picture, and
rarely do the circle and square appear
together; this is an indication of the
psychic state of 20th century man:
dissociation of conscious and unconscious
split between reason and emotion, and
mind and body (Jaffe, 1961).

The mandala is reached through and pre-
ceded by various stages of "initiation"
and "differentiation." The first stage
of differentiation or separation appears
in the hero myth. The individuation
images evolved to strengthen ego con-
sciousness and awareness of one's own
strength and to ease transitional stress,
or the so-called growing pains experi-
enced in the major phases of one's
growth--birth, adolescence and pub-
escence, separation from mother,
martial, maturation of self. The hero
in myth--whether the knight fighting a
dragon, or Superman fighting organized
crime--helps the ego, the core of con-
sciousness, of the young to cope with the
stress of efforts to adapt to changes and
new environments. The ritual (birthday
party, anniversary, marriage and funeral)
involved in initiation and graduation

40
ceremonies makes the transition meaningful, and ego separation more gradual and tolerable (Henderson, 1961). In the typical initiation, be it in the fraternity house, a traditional society's secret mysteries, or military induction, the novice is called upon to give up willful ambition, pride and desire and to submit to the ordeal. The purpose is to create a "symbolic mood of death from which may spring the symbolic mood of rebirth." The hero figure is thus regarded as "the symbolic figure by which emerging ego overcomes the inertia of unconscious mind and liberates the mature man from regressive longing to return to the blissful state of infancy in a world dominated and protected by his mother" (Henderson, 1961). Many individuals who find it stressful to live in the new environment yearn to retreat to their past, familiar environment. While for most people, Henderson notes, the dark or negative side of personality remains unconscious, the hero, on the contrary, must realize that the shadow exists and that he can draw strength from it. He must come to terms with its destructive power if he is to become sufficiently strong. One cannot help but be reminded of the cases of Samson and Delilah, Dr. Zhivago, or Luke Skywalker and Darth Vader in the recent Star Wars movies.

To environmental designers, initiation images seem related to the transitional treatment from one space to another--indoors to outdoor, private to public. Sensitive designers know unritualized or ambiguous or abrupt transitions in space can be stressful to persons moving across the boundaries of places. Consider the importance of the gate or step, entrance and foyer, bridge, and other structures which articulate the transition from one place to another, public to private territories, ambivalent space between outdoor and indoor like the verandah, porch, extended roof, colonnade, and under-the-eave space, also ease transition. To urban designers, it signifies the importance of articulating what Kevin Lynch called 'edge,' 'district' and also the ritual space in the city, for parade, civic ceremony and celebration, where the members of a community find not only a common ground of experience but also reinforcement of adaptation to changes of time by celebrating its passage.

This process of initiation resulting in "differentiation" must eventually be "reintegrated," as I said earlier, into an individual Self. Thus the individuation and mandala images can be related to the fundamental forming principles: "unity-in-diversity," "order-in-chaos," "one-in-whole," "whole-in-one," and what Koestler called "structural differentiation with functional integration," which is characteristic of all the creative process of life.

Anima, Animus and Syzygy

Anima points to the female element in every male, and Animus, the male element in every female. The Anima is a "personification of all feminine psychological tendencies in a man's psyche," such as vague feelings, moods, prophetic hunches, receptiveness of the irrational, capacity for personal love, feeling for nature and his relation to the unconscious (Von Franz, 1961). Anima is the "male personification of the unconscious in woman." Anima and Animus reflect the continuity and indivisibility of male and female in the mind, as male and female are related in its biological bases except the sex-determining Y chromosome.

The most frequent manifestation of the anima takes the form of erotic fantasy and pornography and this crude and primitive aspect of the anima is known to become compulsive only when a man does not sufficiently cultivate his feeling and relationships and when his feeling toward life remains infantile (Von Franz, 1961). The character of man's anima is believed to be shaped by his mother, and it is the presence of the anima that causes a man to fall suddenly in love when he sees some particular woman for the first time. Likewise a woman falling in love with a picture or a film star is attributed to her animus being projected on the man (Von Franz, 1961). The Anima is a factor of the utmost importance in the psychology of a man wherever emotions and affections are at work. When Anima is strongly constellated, she is said to soften the man's character and make him irritable, moody, jealous, vain and unadjusted, leaving him in a state of discontent (Jung, 1959).

Four phases in the development of Anima and Animus are recognized. In the case of Anima they are First, purely unselfconscious, instinctual, biological stage, symbolized by the figure of Eve; Second, Romantic and aesthetic level, which is still characterized by sexual elements, as is the case with Faust's Helen, or Homer's Sirens; Third, Love (Eros) raised to the heights of spiritual devotion, i.e.,
Virgin Mary; and Fourth, Wisdom, transcending even the most holy and the most pure, i.e., Sapientia or Mona Lisa (Henderson, 1961). Similarly four stages in Animus development are First, personification or mere physical power; characterized by admiration of athletes, champions and muscle men; Second, possession of initiative and capacity for planned action and rational control; Third, facility of words, conceptual thinking such as in the professor and clergyman; and Fourth, incarnation of meaning where Animus becomes a mediator of religious experience and gives woman spiritual firmness and inner support (Von Franz, 1961).

Anima is thus related to envy, lust, sensuality, lies, incest fantasies, highly charged emotional contents in religious ideas, and--a favorite of medieval myth--the "damsel in distress," "beauty and the beast," and the knight who pledges himself to the service of his lady, Virgin Mary, and Kwan-Yin in Buddhism (Jaffe, 1961). On the other hand, Animus, in its negative side, is related to brutality, recklessness, empty talk and silence, obstinate and evil ideas. Yet it too can build a bridge to the Self through creativity activity (Von Franz, 1961).

Anima and Animus together point to another archetype of Jung, the Syzygy, a tendency of the "paired opposites where the one is never separated from the other, its antithesis"--e.g., male-female; good and evil; white and black; day and night; the front and back and many other dualistic cognitive schemata universally prevalent in many primitive cultures (Jung, 1959). As Jung correctly pointed out, the "divine syzygies reach down on one side into the obscurities of primitive mythologies and up, on the other, into the philosophical speculations of Gnosticism and of classical Chinese Yin-Yang philosophy (Jung, 1959).

The Syzygy motif, with its emotionally charged contents lying in the unconscious, is said to express the fact that a masculine element is always paired with a feminine one: the wide distribution and extraordinary emotionality of this motif proves that it is a fundamental psychic factor of great importance.

Anima thus plays both positive and negative, or creative and destructive, roles depending upon person and development stages. As a positive aspect, Anima is said to play a vital role in "putting a man's mind in tune with the right inner value and thereby opening the way into profound inner depths. Whenever a man's logical mind is incapable of discerning facts that are hidden in his unconscious, the anima is said to help to dig them out" (Von Franz, 1961). Even in the hero-dragon battle, which is the archetype of individuation, expressive of the process of growing up, the hero's task is to have aim that goes beyond biological and mental adjustment. The battle liberates Anima as that inner component of the psyche which is necessary for any creative achievement (Henderson, 1961). In the fairy tale of the Beauty and the Beast, Beauty, by learning to love the Beast, "awakens to the power of human love concealed in its animal (and therefore imperfect) but genuinely erotic form." This represents "an awakening of her true function of relatedness, enabling her to accept the erotic component of her original wish, which has to be repressed because of a fear of incest" (Henderson, 1961). The phase of individuation which involves separation from the mother is thus a process whereby the growing youth frees himself from the Anima fascination of his mother. So, a permanent loss of the Anima means "diminution of vitality, of flexibility and of human kindness," the personality qualities closely associated with creative persons (Jung, 1959). One is tempted to speculate if it is this Anima and Animus archetype that explains why the nude occupied a dominant position in Western Art in its early phase of evolution.

This archetype enables us to appreciate better the value of erotic symbolism in and surrounding the environmental structure. The frequent and pervasive phallic symbol (such as chimney, tower, highrise structure, and our instinctual urge to be related to the opposite sex, and to creatively reconcile the Yin-Yang dualism) can be expressed in design. The challenge to the designer is to give a well-developed expression of anima, from the purely biological state (e.g. Mona Lisa) where love, eros, and connedness transcends even the most pure and the most holy (Von Franz, 1961).

Specifically, how to give such catharsis to the Anima images is yet to be explored. Yet the point is the need for the designer to accept the legitimate role and place of eroticism and Anima in environmental design. Up to us is the issue whether we use erotic imagery just to fulfill the "repressed instinctual
desire" or to better understand our inner self, and its dark negative self, and find a way to creatively reconcile and transcend the destructive tendency for ultimate Self-actualization. The eroticism depicted in Moslem popular art and the Naked Maya of Goya on one hand, and that of the Virgin Mary and Kwan-Yin on the other, are miles apart. Though both have distinct adaptive value, one relies on submission to instinctual desire and tends to be possessed by it, while the other accepts but transcends the sexual relatedness and assimilates them. The separation of sex from love in our contemporary life, and thus separating enjoyment of sex as bodily aesthetic sensation from the emotional symbolic experience, has brought the separation of intercourse--with its literal meaning of communication--of body from intercourse of the mind. This separation between love, marriage, sex and birth has brought at once freedom and anxiety. This emphasis on sex, on bodily sensation without bandage to moral obligation, seems to parallel the separation of formal aesthetics and symbolic aesthetics brought about by the Renaissance. That this sexual separation came five centuries later is understandable in that it was one of the last liberated areas in our culture.

I am not discussing sex as a moral issue here. To designers it is important to realize the ego separation in sex was both necessary for freedom of mind and body, and yet stressful as long as the split persists. Therefore, we have to realize a new level of synthesis just as recent "Post-Modern" designers began to move toward the reintegration of formal aesthetics with symbolic aesthetics, and the present with the past, having expressed the stressful but necessary separation from the past as a step of individuation in the Modern Movement in design. Perhaps most fundamentally, romanticism, the yearning for relatedness, eros, to the origin and the opposite seems to be related to Anima, whereas classicism, the impulse for order, simplicity, understanding and knowledge, is related to Animus.

Thus far I have described the five archetypes briefly illustrating their implication to fantasy-provoking designs. As some readers might have noticed during this discussion, these archetypes are not mutually exclusive or distinctly separated, but indivisibly interrelated to complement each other. Child image is related to Mother and Individuation, and Anima to the Mother and hero myth, and to both incestual and bestial sexuality.

In addition to attending to this profound yet undeveloped area of the design for the "collective unconscious," we can think of other approaches to designing for fantasy and dream. These approaches include integration of fantastic and dream-like images into the design processes themselves, consequently making the form of environmental structures reminiscent of dream images and meaningful to the unconscious, creating a dream-like atmosphere. To design for fantasy, it is not enough for designers to have knowledge of fantasy, but they must be imaginative and literally fantastic and fantasy-loving as well. This means that they have to be able to manipulate "active imagination" or "controlled fantasy" by self-consciously activating their unconscious as discussed later in this paper.

Going back to the methods of creating dream-like images, one can suggest that designers apply at least the following few points, which are by no means exhaustive or in order of importance (in fact, most of these techniques are consciously or unconsciously employed in fantastic, expressionistic symbolic arts and architecture):

1. Extend the conscious into the unconscious, reaching to the core of self. Transcend reason, logic and social convention, stretching possibilities to "blow" the conscious mind.

2. Instigate imagination by allusion to childhood dream, folklore and fairy-tale, festive carnivals, or science fiction; heighten aesthetic sensation by exaggeration of various perceptual elements (such as light, color, texture, perspective, scale).

3. Provoke nostalgia (sense of the remote and/or eternal) and suggest historical elements and events.

4. Use condensation, compression, distortion, disorder and application of optical illusion to erase the sense of linear time and static space. Create a sense of ruins, emptiness, desolation, loneliness, and sadness (Arnason, 1975).

5. Create a sense of freedom by ignoring convention, prejudice, social laws, and, most of all, natural laws such as causal sequences, gravity, or limits to life on earth. Introduce controlled chance happening and whimsical variation.

6. Make the form ambivalent and open-ended to be receptive to varied
personal "projections" and interpretations. Employ plural significance, and flexible, fluid, indefinite morphological boundary lines.

(7) Apply bodily metaphor to create a sense of relatedness to man: Use human scale, a sense of rhythm, and erotic and facial metaphors. Use biomorphic form, images of animals; reject orthogonality, regularity, reducibility.

(8) Create a morphological pun in humorous ways. Juxtapose opposites: organic and inorganic; white and black; man and animal; masculinity femininity; good and evil; beauty and ugliness. Link the mutually distant and the apparently contradictory.

In one way or another all designers and artists are fantasists. As I noted earlier, all human beings are fantasists, but artists and designers are among the few who are privileged today to employ and express fantasy in their social role. This brings us to the second topic of this paper: the application of fantasy to the design process. As it was pointed out earlier, the nature of fantasy has intrinsic relevance to design because of its creative potentials and its effect in freeing us from our rigid ego, the conscious, which is itself limited and no less limits our imagination. Of course, it is very important for us to remember one fundamental difference between fantasy and design: fantasy does not have to be realistic but design must. Design and "true creativity" have to be relevant to problems in the external world (Baron, 1969; Taylor, 1975). Designers have to employ reason in order to rigorously examine the relevance and practicality of their "fantastic ideas" and to consistently execute them. They must stand firmly on the ground if their heads are reaching for the sky.

This rigorous, frequently time consuming and necessarily patient process of testing, refining, adjusting, validating and implementing underlies many revolutionary scientific discoveries such as those of Darwin or Einstein. And precisely this lack of realism explains why many fantastic ideas of Modern architecture, such as Le Corbusier's early urban design proposals, Frank Lloyd Wright's design of an organic city, Archigram's plug-in architecture, Japanese Metabolists' megastructure and Soleri's Arcology, remain as fantasy and dream or experiment, but not as designs to be realized or modelled after. The truly creative product has a generic quality: it generates further creative ideas. In this respect none of these designs just mentioned are truly creative. They have been captive, destructive, and disruptive. Therefore, while we designers, like any ordinary and normal persons, can possess fantasy, we must not be possessed by it. Dreams may live in architecture, but architecture must not live in dreams; after all we have to wake up from dreams. To control and activate fantasy freely is integrating, creative and self-actualizing whereas to be rigidly controlled and captivated by it is alienating and escapist at best, pathetic and destructive at worst. Having cautioned against the potential danger of confusing fantasy as the sole substance in design process, we can now unworriedly explain why we can productively employ fantasy and dream, as a "raw" material to be "cooked" through the design process.

Today we know from neurophysiologists that fantasy and dream are the events of some deeper layer of our brain called the limbic area, whereas our linguistic faculty and conceptual reasoning are the acts of more recent brain differentiation on its surface (McLean, 1973). We also know that to the right-handed person, the simultaneous formal and spatial imageries are processed in the right brain hemisphere, whereas sequential, causal thinking is localized in the left brain hemisphere. Yet, because of the relative recency of human brain evolution, our brain does not yet show full integration between its superficial and deeper layers, or between left and right hemispheres (McLean, 1973). Thus there is, to use Koestler's word, "structural differentiation" without sufficient "functional integration." This undesirable split and precarious connection seems to explain the split personality and partial intelligence that underlies the pervasive human and global problems of today. To employ fantasy and dream in our design process, we therefore need to activate through "active fantasy" the deeper layers of our brain, and realize and release a total intelligence and a total sensitivity that is usually insulated by our consciousness. This is why integration is such a self-actualizing experience, and perhaps why the design profession is so rewarding and attractive. Through design we can find a way to become a wholesome personality and raise the creative imagination of others.

To realize true creativity, creativity relevant to but not inhibited by reality, we cannot afford to limit ourselves to the partial brain or to partial intelligence.
or sensitivity in that matter. We need to realize fully the potential of our psyche. To do this it is of critical importance that we understand how flexible and fluid personality traits are maintained through free imagination at the earlier phase and controlled reasoning at the later phase. We can use images to integrate and be specific, and concepts to differentiate and be general. This flexibility, whether organic or inorganic, whether matter or mind, realizes "functional integration and formal differentiation," actualizing all the surplus potential by which Koestler defined creativity.

For some time we designers have already practiced the design process models--consisting of idea generation and evaluation of alternatives. Problems, however, develop in that the models are frequently taken in a rigid linear form--placing the designers in a wrong frame of mind--and in that relatively little teaching and research are done in design school on how to 'facilitate idea generation' and what kinds of methods we can and need to use to evaluate. We have developed techniques such as "brainstorming," "synergetic," and even "happenings," "collective creativity," and employed "participatory design," and "advocacy design." Yet, as long as fantasy, dream, and aesthetic sensitivity are aroused only at individual levels, we will be unable to see fantastic designs through collective and rational teamwork. Design, like all organic processes, is not additive but a synthetic and synergetic process. How we can expect this crucial synergy from a group of people when we cannot make the necessary integration within our own individual brains remains a crucial question. Creative work, particularly in the idea-generation phase, will remain an individual's task. It is imperative that we all try to raise imaginativeness at personal levels, and this from kindergarten to college. This is the way to design for fantasy, to use fantasy for design, and most of all the way to unfold the core of our Self, that we call genius, in a way toward self-actualization, which is the instinctual and directed tendency of all life forms, a tendency that constitutes all forms of creativity (Rogers, 1962).

In closing I would like to share with you a landscape architect's account of his conversation with the architect Louis I. Kahn, whom I admire enormously as a mentor. The setting is a train on its way to New York City.

The landscape architect: "Mr. Kahn, how do you design?"
Kahn: "I design through dreaming."
The landscape architect: "Do you mean that you design at night?"
Kahn: "No, at night I sleep; during the day I dream."

FOOTNOTES
1. An earlier form of this paper was presented at The Symposium Making Dreams Come True: Design in the Aid of Fantasy sponsored by San Francisco Center for Architecture and Planning and A.I.A. San Francisco Chapter, February 1981.

2. Fantasy, according to Klinger, shares with dream "sequential fusion" but generally not "morphological fusion." (Klinger, 1961). Fantasy is regarded as more or less one's own conscious "invention" and remains on the surface of personal things and conscious expectation; dream images, however, is considered to have a life of their own, developing according to their own logic (Jordan, 1979).

3. These designs remain more "allegorical" than "symbolical," to use Goldwater's differentiations, in that it relies on signs and symbols, most of which no longer convey the same (or any) meanings to the majority of the public today.

REFERENCES


Forisha, Barbara L. The Outside and the


Mackinnon, Donald W. IPAR's Contribution to the Conceptualization and Study of Creativity. In I. A. Taylor and J. W. Getzel (Eds.) Perspectives in Creativity. 1975.


Torrance, Paul E. Developing Creative Thinking Through School Experiences. In I. A. Taylor and J. W. Getzel...

PERCEPTION THEORY, FORMAL AESTHETICS AND
THE BASIC DESIGN COURSE

Jon Lang
University of Pennsylvania

ABSTRACT

A study of the historical antecedents and the development of the Basic Design course during this century shows the intellectual debt it owes to the Gestalt theory of perception. The Gestalt theory concepts of form and expression are fundamental to the compositional principles either implicit or explicit in the way Basic Design is usually taught today. The Basic Design course has been much criticized because it instilled a method of working and thinking which seems to have inhibited individual creative problem solving and also because it misleads students about the nature of formal aesthetics in architecture. Gestalt theory has been challenged by both the Transactionalist and Ecological approaches to the explanation of the perceptual processes. The former approach stresses the importance of experience in perception and the latter the role of movement in comprehending and appreciating the environment. Recent work in Empirical Aesthetics also informs the designer about issues of order, complexity and individual differences in aesthetic experience. Formal composition is an inevitable part of an architect's work. The Basic Design course is an important part of an architect's education. It needs to be revised in light of recent developments in the psychology of perception.

The adequacy of the present formulation of the Basic Design course, as it is generally taught, has been severely criticized (e.g. Jones, 1969). The objective of this paper is to point out some of its present problems, particularly those that have to do with the course's theoretical underpinnings, and to suggest an approach to their solution. This paper begins with an overview of the development of Basic Design, its intellectual origins, and a brief outline of Basic Design as it is conceived at present. Once this has been done it will be possible to describe the problems which exist and the direction in which a solution can be found.

THE BASIC DESIGN COURSE -- HISTORICAL ANTECEDENTS

The Basic Design course is the British and American descendent of the Bauhaus "Vorkurs" and of the "Basic Course" developed at the VKHUTEMAS (State Higher Art and Technical Studios) and the INKHUK (Institute of Artistic Culture) in Moscow after the revolution (Khasanova, 1971). These courses were designed for artists and architects alike. The international currents of Art Nouveau had brought the arts closer together and this continued with the work of Kazemir Malevich, El Lissitzky, Vadim Tatlin, Wassali Kandinsky and Alexander Rodchenko. Both the Constructivist and Rationalist movements in Soviet architecture and art were committed to the "scrupulous scientific verification of their work" on all its dimensions (Senkevitz, 1974). The Basic Course at the VKHUTEMAS emphasized a "psycho-analytical method" for studying the principles and techniques of "spatial composition."
A. Ladovsky pioneered the link between formal aesthetics and the psycholo-
gy of perception, particular Gestalt theo-
ry (Khan-Mohomedov, 1971).

Ladovsky's interest in the processes of visual perception was probably sparked by
massily Kandinsky and the program he ini-
itiated at the INHUK in 1920. The prime
source of his theoretical inspiration was,
however, provided by Hugo Munsterberg
(Barkevitch, 1974). Although Munster-
berg's name is not generally associated
with Gestalt theory, his research find-
ings in the 1890's at Freiberg and later
at Harvard presage the findings of Ge-
stalt psychology. His work encouraged
the establishment of a research laboratory
at the Vkhutemas but, more importantly,
also provided the theoretical under-
pinnings of the Basic Course, the Vorkurs
and Basic Design as it is still taught
today.

With the switch to "social realism" in
Soviet architectural ideology based on the
332 Stalinist decree, and the departure
of key individuals to the West, the inteli-
lectual center in the exploration of form-
al aesthetics shifted to the Bauhaus in
Weimar where Johannes Itten had already
given his version of the Basic Course
-- the Vorkurs -- since 1919 (see Itten,
1964).

Originally designed as a "weeding" course,
the Vorkurs came to have four inter-rela-
ted objectives: 1) the education of per-
ception and sensitivity to the environ-
ment, 2) the attainment of artistic ef-
fects, 3) the expansion of "artistic
thinking," and 4) the liberation of the
inner spiritual sense of perception."
The first objective was attained through
the exploration of contrasting textures
and materials, the second and third
through exercises bringing attention to
contrasts in color and form and the prin-
ciples of abstract composition, and the
fourth through another set of exercises
with labile materials. These ideas were
taken further by Paul Klee and ultimately
Moholy-Nagy and Albers.

The effort to identify the elements of de-
sign and rules for composition inevitably
led to a concern with perception psycho-
logy. It is still one of the paradoxes of
formal aesthetic theory that there is a
striving for both scientific objectivity
and for self-expression unfettered by any
compositional laws of nature (Jones, 1969).
Kandinsky (1926) noted that "a composition
is nothing other than an exact law abiding
organization of the vital forces which in
the form of tensions are shut up in ele-
ments." He was suggesting that composi-
tion must proceed from an analysis of the
tensions and the relationship between the
forms the artist is using. The laws go-
vading this process are similar to the
Gestalt laws of visual organization and the
concept of field forces.

A NOTE ON GESTALT PSYCHOLOGY

Gestalt psychology arose in the second de-
cade of this century in response to the
prevalent mechanistic theories in psycho-
logy. It was part of a movement in psych-
ology away from sensationalism to the
study of the whole being. Individuals,
social groups and the state were studied
as integrated wholes. The focus of re-
search was on studying unitary functions,
emphasizing the importance of configura-
tion in perception and insight in learn-
ing. Learning was perceived as the or-
ganization of past experience in a new
way. Education should thus focus on
teaching people to have new insights.

There were parallel movements to Gestalt
psychological theory in economics, politi-
cal science and history. The focus on
the whole being is still central to many
aspects of psychology and psychotherapy
today. Central to Gestalt theory in the
1930's and its congruence, if not impact,
on architectural concepts of formal aes-
thetics was its focus on perception theory.

Studying unitary functions, Gestalt theory,
emphasized the importance of configura-
tion in perception. The research was con-
cerned with pattern perception, organiza-
tion and expression. The basic tenets of
the Gestalt theory of perception have been
fully described in psychology texts (e.g.
Hochberg, 1964) and in writings on design
(e.g. Lang, 1974). Only a very cursory
overview of this theory of perception will
be given here.

Form, field forces and isomorphism are the
basic concepts of the Gestalt theory of
visual perception. Form is that which
stands apart from its background. Field
forces are the psycho-biological forces
that give expression to lines and planes.
Isomorphism is the term describing the
parallelism between the form of underlying
neurological processes and the form of the
perceptual experience. Gestalt theory
thus suggests that a form is a manifesta-
tion of forces. According to the theory,
visual dynamics are not subjective asso-
ciations. They precede perceptions of
pattern. Today the theory of isomorphism
used to explain this is far less accept-
ed than the principles of visual organi-
ization (Gregory, 1966; Gibson, 1966,
1979). These principles, or laws, in-
clude those of proximity, similarity, 
closure, good continuance, closedness,
area and symmetry. Gestalt psycholo-
gists believed that a single principle under-
lies all these tendencies -- perceptions
take the most stable form under the cir-
cumstances.

There is little direct evidence of the
knowledge of Gestalt theory on the part
of the Bauhaus masters. Later writers
such as Kepes (1944), de Sausmarez (1966)
and Isaac (1971) acknowledge their intel-
lectual debt to Gestalt psychology. The
linkage is even more explicit in the
writings of Arnheim (1965, 1977) and
Ushenko (1953). In Kandinsky's book
Point and Line to Plane (1926), however,
there is sufficient similarity between
text, diagrams and the prevailing thought
in Gestalt psychology to suggest the
Kandinsky was familiar with the work of
Kohler, Koffka and Wertheimer. The book
actually predates the major treatises of
Kohler (1929) and Koffka (1935) but the
work of Gestalt psychologists was pub-
lished as early as 1912 (Overy 1969).
During the 1930's a course on Gestalt
psychology was taught at the Bauhaus by
von Durckheim. Hans Wingler (1969) notes:
"The fact that the theories of Kandinsky
and Klee found scientific affirmation in
these psychological classes accounted for
their importance to the Bauhaus." With
the coming of National Socialism to Ger-
many, and the emigration of many of the
Bauhaus masters to schools of design out-
side Germany, the Basic Design course was
spread throughout the world.

THE BASIC DESIGN COURSE TODAY

While there are different formulations of
the Basic Design course, most present mo-
dels are based on a postulation of "ele-
ments and laws of design." Jones (1969)
notes "all versions of Basic Design rest
ultimately on the belief there exist what
Gropius called 'elements and laws of de-
sign' -- 'elements of form and 'laws'
for putting them together." In addition
patterns and shapes communicate feelings
such as tensions or happiness (Levi, 1974,
Isaac, 1971). All versions assume, even
though many are ambivalent about it, that
"visual coherence is more related to our
neural and psychological being than to
our processes of intellecction" (de Saus-

The way different subjects are organized
within the course varies. If books on
Basic Design (e.g. Kepes, 1944, de Saus-
marez 1964, Isaac, 1971) can be taken as
an indicator, however, they have a common
progression of ideas from a discussion of
primary elements and forces, to a discus-
sion of the two-dimensional field and the
space frame, to a discussion of the ap-
parent movement of objects and the expres-
sive meaning of lines and shapes and,
sometimes, the motion of objects.

The fundamental element of design is said
to be the dot. Dots can be chained to-
gether to form lines, lines to form planes,
and planes to form volumes. Unified
schemes can be obtained by applying the
Gestalt laws of visual organization. Con-
cepts of proportion are also important.
Some of these are based on simple ratios
and are said to be static. More complex
ones are said to be dynamic. The ratio
called the Golden Section was an estab-
lished canon of design for nineteenth cen-
tury academics. It still enjoys consider-
able popularity because it is said to be
visually pleasing.

Patterns of lines and forms can also be
organized to create certain visual ef-
facts that are said to arouse emotions
(Levi, 1974). Points, lines, volumes and
their expressive qualities are claimed to
be the basic elements of design. "Just
as letters of the alphabet can be put to-
gether in innumerable ways to form words
which convey meanings, so the optical
measures and qualities can be brought to-
gether in innumerable ways" (Kepes, 1944).
Implicit in this position is that certain
patterns are more visually pleasing than
others because of the nature of the psy-
cho-physiological resonance or parallel-
ism between neurological processes and
the pattern itself. In addition, or al-
ternatively, some meanings directly com-
unicated by the patterns have more plea-
sant associations for the viewer than
others. These are intuitively attractive
observations because they seem to rein-
force common sense. They do, however,
need to be treated with caution.

Basic Design as taught today is attracting
much criticism which is often contradic-
tory and confused. It is, however, clear
that present formulations of Basic Design
are lacking in conceptual clarity. The
word "scientific" can hardly be applied
to their positive theoretical bases. Be-
fore a reformulation can be suggested, it
is necessary to understand more clearly
the basic problems with present formulat-
ions.
PROBLEMS WITH PRESENT FORMULATIONS OF BASIC DESIGN

A number of broad philosophical questions can be raised about the centrality of the Basic Design course in architectural education and of its use as a weeding course. While this is a fundamental issue, it is not of concern here. The concern here is with the course as a means of educating students about formal aesthetics. Two basic concerns can be raised in this regard. The first has to do with the atheoretical way in which it is taught and the second with its intellectual foundation.

a) The Atheoretical Nature of Present Courses

The Basic Design course has drawn on theory but it has not itself become theoretical. Most books on formal aesthetics consist of a series of assertions without much explanation. All books make passing references to perception theory, some (e.g. Kepes, 1944) to a greater extent than others (e.g. Prak, 1968, Bacon, 1967, Spreiregen, 1965, Isaac, 1971). Yet all their ideas draw on Gestalt theory. This is only clearly developed in Arnheim's work (e.g. 1965) which has to do with painting rather than architecture. When he deals with architecture (e.g. 1977) the links are more obscure. The atheoretical nature of presentations of formal aesthetics has limited serious discussions of the topic and explains why, apart from Gropius' brief flirtation with Transactional theory (Gropius, 1947), the Basic Design course has not changed as perception theory has developed.

Teaching Basic Design atheoretically may well be one reason that, as Jones (1969) claims, it hampers creative thinking. If students do not understand the conjectural nature of the theoretical foundations of its principles of formal aesthetics they are likely to assume that it is scientifically factual. In this way it hampers the exploration of ideas and also the serious testing of them. If one of the objectives of architectural education is to encourage divergent thinking and the solving of problems, then students need to know that there are competing theories underlying the concepts of formal aesthetics they are taught.

b) Perception Theory and Basic Design

One of the factors that must have attracted architects and artists to Gestalt theory is its emphasis on the characteristics of whole or relational patterns. Gestalt psychologists' search for the "natural units of analysis of perception" must have also attracted their empathy. The Gestalt position is highly informative on many dimensions. It has been assumed to be as applicable to understanding of the urban and architectural environment as to the perception of patterns on a sheet of paper. This has been seriously questioned (e.g. Gibson, 1966). Three lines of research, while contradictory in themselves, suggest ways of increasing the external validity of Basic Design.

(i) Transactional Theory emphasizes the role of experience in perception and focuses on the dynamic relationship between person and environment. Perception is considered to be a transactional process. A person "creates a world for himself" (Ittelson, 1960). The intellectual underpinnings for this position are in transactional philosophy (Dewey and Bentley, 1949), the psychology of Adelbert Ames (1903). Transactional theory assumes that past experiences are projected on to the present situation in relationship to one's needs, that perception is governed by expectancies and predispositions and that the information obtained from the environment has a probabilistic nature to it which is validated through action. This is a major contradiction to the Gestalt position. It suggests that preferences for specific patterns, proportions and the meanings they convey are all products of experience and are thus culture bound.

(ii) Ecological Theory contradicts the Gestalt concept of isomorphism and the Transactional interpretation of the role of experience in perception. It is a radical theory which postulates that the structure of light, sound waves etc. can convey information directly about the world without the mind having to reconstruct "meaningless sense data" (Gibson, 1966). In terms of visual perception, the theory states that as long as the environment is illuminated, the sheaf of light rays that converge at a station point is structured by the faces and facets of the world. As a person moves, this structure is transformed. There is information in the structure which can be perceived. Ulrich Neisser (1977) suggests that there have to be schemata in the mind to guide exploration.

A person explores the environment to perceive the finer and finer details by moving the head, eyes and body. Thus our perception of the environment through movement
becomes important. With experience a person is able to identify the finer and finer details and broader relationships (Gibson and Gibson, 1955). We attend to what is important to us. This position downplays formal aesthetics as a major factor in everyday environmental preference. People do, however, stop and examine and appreciate the formal structure of the environment. This is likely to be a small minority of the population but is something that designers are wont to do.

(iii) Empirical Aesthetics has been concerned with establishing correlations between patterns of the environment and people's hedonic responses to them. There have been four theoretical orientations to these studies: 1) Information theory which either uses Empiricist theories of form (Moles, 1966) or information theory as a framework of analysis (e.g. Aramis, 1971), 2) Semantic Approaches which focus on the learnt associations between patterns and meanings (Lyons, 1968), 3) Semiotic approaches which some is an extension of the semantic approach with the inclusion of concepts of the transfer of meaning, and to some, who assert that learning is different from the formation of associations in context, it is a contradiction (both approaches are based on the writings of philosopher de Saussure (1915)), and 4) the Psycho-biological approach (Berlyne, 1974) which has antecedents in Gestalt theory but focuses on the arousal level of an individual, environmental patterns, perceptions of their interesting and their pleasurableness. Much of the recent development of post-modernist theory in architecture is allied to the semantic and semiotic approaches.

IMPLICATIONS OF RECENT THEORETICAL DEVELOPMENTS FOR BASIC DESIGN

The Basic Design course needs to recognize some fundamental points about perception theory. The first is that there are co-existing and contradictory theories of perception so that assertions about visual phenomena cannot be taught as truths but must be stated as conjectures. The second is, however, that there is much agreement on the nature of the processes of perception. This agreement has implications for the content of Basic Design courses. These areas of agreement and their implication for design are:

(i) Perception is multi-modal -- formal aesthetics is primarily but not solely a visual phenomenon. Environmental aesthetics must be concerned with the non-visual environment (see Southworth, 1969).

(ii) Movement plays a major role in environmental perception therefore concepts of order, complexity etc. have to do with the sequence experience of the environment as much as facadial design. In architecture, a concern with sequential experience design is one of long standing (Martiensen, 1956). The concern is with the opening up and closing down of vistas as one moves past walls, through and past buildings and the landscape. Formal Aesthetics needs to be concerned with the pleasurableness of these pattern transformations as much as anything else (see Thiel, 1961; Halprin 1965, Cullen 1961). It needs to be concerned with opaque geometry (Lang 1974).

(iii) The Gestalt laws of visual organization may well be ways in which people order the environment. The concept of architectural unity and the means to achieve it are well described in most texts on Basic Design (e.g. Isaac, 1971). The relationship between architectural unity and aesthetic evaluation is, however, a topic open for research.

(iv) The Gestalt principles of the field forces and isomorphism and thus the formal aesthetic concepts of the "universality of expressiveness" are open to serious question. In the architectural literature this question is exemplified by the different positions taken by Rudolf Arnheim (1977), a Gestaltist and Robert Venturi (1976) whose implicit model of perception falls more into the semantic and semiotic field of empirical aesthetics.

(v) People learn to pay attention to finer and finer details of patterns and broader categories with experience. The range of understanding and of concern with the formal patterning of buildings, landscapes and urban complexes varies considerably amongst members of any population. We need to understand this better. Without this understanding it is impossible to develop a coherent normative position on how concerned architects should be about the formal aesthetic aspects of their work. The same conclusion can be drawn about another agreement on the nature of perception:

(vi) What people pay attention to depends on their motivations. If one accepts Maslow's hierarchical model of human needs, formal aesthetics is not only a perceptual luxury but only of concern to most people after symbolic aesthetic considerations have been sufficiently met.
(vii) Associational meanings of the environment are learnt. Design research needs to understand the mass-cultural development of meanings of basic shapes of the environment.

(viii) The normative ordering principles of architects are artificial constructs that have to be detected or learnt by others -- they are not immediate in perception. Many of the ordering principles -- e.g. proportional schema -- used by architects are arbitrary constructs. They are simple enough they may be discernible by other people; more complex ones will have to be explained to them. Whether they respond warmly to the schema once they know it depends on their attitudes to the explanation and/or to the architect.

(ix) Perception is not determined completely by external stimuli. Thus any conclusions an architect has about the impact of a specific pattern of the environment on people cannot be based purely on the pattern itself.

The traditional Vorkurs has misled a generation of architects about the nature of formal aesthetics. We know better now. Basic Design must not be taught as if the Gestalt principles of perception were the total truth. Exercises that students carry out must recognize our enhanced understanding of the perceptual processes.

THOUGHTS ON CHANGING THE BASIC DESIGN COURSE

If the objective of the Basic Design course is to enhance environmental awareness, an understanding of formal aesthetics and the compositional abilities of students, then these should be the distinctive components of the course.

a) Environmental Awareness

The objective here would be to enhance students' understanding of what there is to be perceived -- the potential environment -- and how it is perceived. The students need to understand the nature of the perceptual systems, color perception, theories of perception and individual and cultural differences in ways of looking at the environment. The exercises that accompany lectures and readings can include the traditional ones involving the examinations of surface materials and textures but should also include studies of depth perception, movement through the environment, and the recording of what there is to be perceived via the different sense modalities. The objective is to understand that perceptual learning involves the education of attention.

b) Formal Aesthetics

The goal here would be to understand both positive theory and the normative theories of formal aesthetics. The students need to understand the extent and limitations of the research literature on pattern perception and aesthetic appreciation, the concepts of order and disorder, interestingness and complexity as conceived in different theories of perception. The concepts of expression and association and their theoretical bases and the implications of accepting one theory over another should also be introduced to students as should the ideological positions that have been taken by architects on these matters.

c) Compositional Design

This needs to consist of at least two components -- one would involve exercises in developing two and three dimensional compositions using various principles of order and complexity and testing people's responses to them; the other would involve developing an understanding of the normative principles of different architects and schools of thought. The objective would be to enhance the students understanding of the relationship between habituation levels, and the pleasingness of compositions of various degrees of complexity and order. These exercises should also enhance the students divergent and convergent production skills.

In all of these exercises the student needs to be aware of the focus of the course on formal issues and that these are not necessarily the most fundamental in people's enjoyment of the environment. People's appreciation of the environment is largely dependent on their attitudes to the behavior settings as a whole -- the standing patterns of behavior, the people engaged in them as well as the symbolic and formal qualities of the milieu and how they afford people's needs.

CONCLUSION

The Basic Design course is a fundamental one in architecture. Present formulations of Basic Design draw heavily on Gestalt theory and have become indoctrination courses that narrow a student's knowledge and creative thinking -- the opposite of
the original intention (Jones, 1969). One reson is that the Gestalt principles of perception have been taught as principles of design with very little explanation of their theoretical underpinnings. As these foundations are questioned and ones with greater explanatory power substituted so must the teaching of Basic Design recognize this. Architects and other designers need to understand the strengths and limitations of their claims about how people experience the environment and the implications of this for positive and normative theories.

REFERENCES


Ushenko, Andrew Paul, Dynamics of Art, Bloomington, Ind.: Indiana University Press, 1953.


1.2 METHODOLOGICAL ISSUES AND THEORETICAL PERSPECTIVES
THE CHALLENGE OF THE CASE STUDY FOR THE ENVIRONMENTAL DESIGN RESEARCHER

Gary H. Winkel
City University of New York

ABSTRACT

Many environmental design research problems involve the use of so-called case study procedures. Because of the predominance of experimental procedures it is often assumed that case study investigations are poor substitutes for the classical forms of experimental design. The purpose of this paper is to initiate a discussion of case study procedures to determine what their strengths and weaknesses may be. A number of suggestions are offered for the utilization of case study data in a form that will allow the results of such work to be replicable, reliable and to provide the basis for causal arguments.

INTRODUCTION

One of the most difficult challenges that we face in the conduct of environmental research involves the types of methodologies that we must employ when generating information about person-environment relationships. Unlike our colleagues in laboratory based research, the setting and its characteristics represent both an integral and variable aspect of our efforts toward explanation. Thus, we cannot always assume that the setting and its diversity should be considered as a constant or relatively unchanging background feature in research design.

Efforts to develop setting descriptions in the form of theoretical categories continues to be an active area of environmental research (Barker, 1968; Bechtel, 1977; Frederiksen, 1974; Moos, 1974; Sells, 1974; Stokols, 1981; Stokols and Shumaker, 1981). In our discussion of the development of environmental theory, we argued that it was necessary to create what might be called contextualized transactionalism as a basis for explanation (Ittelson et. al, 1974). We suggested that the understanding of phenomena of interest to environmentalists required the study of these phenomena situated in different environmental contexts. We suggested further that different environmental settings provided different meanings to the participants who operated in these settings. As a consequence, our methodologies had to be attuned to setting variability within a multidimensional perspective.

Stated as a broad programmatic goal for environmental research, it is difficult to fault the position we advanced. The obvious problem involves the conceptual and procedural strategies that would be required to advance those goals. My intent in this paper is to initiate a discussion of some of the methodological issues that are raised by such an orientation to person-environment study.

For the purpose of this paper these issues may be summarized as: (1) the problem of causal assertions regarding environmental influences on behavior and behavioral impacts on the environment; (2) the consequences of exhaustiveness of description when testing hypotheses in various settings and (3) the evaluation of uniqueness in efforts to understand different environments.

Once we postulate the existence of environmental diversity as a category of environmental research endeavor, we are immediately confronted with the question of whether that diversity can be investigated in a way that will enable us to discriminate among those aspects of the setting that are influential in affecting environmental experience and behavior. Some authors would argue that the variability and dynamism of most settings require holistically oriented case study approaches organized around systematic description (Filstead, 1970; McCall and Simmons, 1969; Weiss, 1969; and Weiss and Rein, 1969). Within this tradition, the analysis of complex systems must proceed as a whole and resulting analyses must, of necessity, be descriptive at least at the early stages of investigation.

Representatives of the hypothesis testing orientation of many social and behavioral scientists have asserted that causal
explanation is possible only within the confines of experimental and quasi-experimental approaches to research design. For example, while Cook and Campbell (1979) recognize the potential value of more case study oriented investigation, the majority of their efforts are organized around the design of research strategies that remove, control or deflect the effects of diverse variables that represent threats to explanation within the hypothesis testing tradition. The implicit theoretical orientation that lays behind these research designs emphasizes the growth of theory from the bottom up so to speak. That is, knowledge regarding environmental systems will proceed cumulatively rather than holistically.

When we approach an environmental design research problem we are immediately confronted with the problems that are associated with the two traditions that I have just summarized briefly. The point at which these two traditions make contact with one another is in the arena of the case study or case study methodology.

In many ways, the choice of the term "case study" is unfortunate. It carries with it the connotation of uniqueness, nonreplicability and noncomparability. From a comparative perspective, case studies are often considered as inferior substitutes for laboratory based investigations. This characterization is largely due to the emphasis that has been placed upon hypothesis testing research within the program evaluation framework. Since much of the research conducted by environmental investigators focusses upon environmental evaluation, it is critical that we begin to examine case study research more carefully to determine where criticisms are appropriate and where such criticism is not warranted.

In the remainder of this paper I would like to explore some of the issues that I think are central to our conceptualization of case studies in the context of environmental research. Let me state clearly at the outset that I wish to approach case study methodology within a causal perspective. That is, I wish to examine the conditions under which it would be possible to adapt the procedural and analytic strategies that have been developed within the evaluation literature to the opportunities and challenges that case study methodology presents. Such an aim is not meant to preclude the valuable contribution that well conducted case studies may make to description within a holistic tradition. Indeed I have argued elsewhere that such research represents an invaluable complement to hypothesis testing and when combined with the latter can advance our understanding of person-environment relationships (Winkel, forthcoming).

The Uniqueness Problem in Case Study Research

When we enter an environmental setting for research purposes, one of our first tasks involves the identification of the experiences and behaviors that characterize those settings. If we proceed within an holistic framework, we may not have any presuppositions about the ranges of behavior that we might encounter there. For example, in our work on the design of hospital environments, we typically begin by observing the discriminably different behaviors that we believe constitute the significant elements of the operating environment (Winkel and Reizenstein, 1982). We wish to know what people experience and what they do. Using combinations of semi-structured observations and informal (but guided) interviews we attempt to catalogue the various human activities that occur in the setting. Such preliminary reconnaissance of environments is essential to our understanding of how the design of the setting might have a bearing on observed behaviors (Winkel, forthcoming).

At the same time, we are attentive to the identification of design features in the environment that appear to have some effect on observed behavior and people's evaluations and reflections of their experiences in these settings. We also record and classify those features of the setting that might affect behavior but which do not necessarily have any immediate design implications. Thus, the social relationships that exist among the users of the environment, any rules or norms that guide behaviors within the setting and any personal qualities of the people involved also represent an essential aspect of environmental description. In the latter instance, we may gather data regarding frequency of environmental use, social class characteristics, age, sex, single versus group utilization of the setting, as well as the expectations and goals that people bring to the setting.
These procedures represent very concrete examples of the basic form of environmental description that lies at the basis of various environmental classification efforts referenced earlier. As such, the resulting information may be considered to be unique to the setting in which it is gathered. If I entered the field setting with a limited range of behaviors and a limited range of environmental variables in which I was interested, the uniqueness would not be altered. The only difference between the two situations is the number of variables that I would consider relevant to my problem area. The important point to note is that the environmental and social factors that comprised the setting under study represent fixed variables (assuming that they continue to be present over the course of the study). These features of interest do not represent a randomly selected set of environmental-social variables but are fixed by the nature of the setting itself. The same situation prevails for the investigator who conducts a laboratory study. In this sense, the laboratory represents a unique set of conditions and thus shares similarities to at least one aspect of the case study in the field. One of the immediate implications of this observation is that quantitative techniques that have been devised for fixed effects models in the laboratory may be applied to data generated in field settings as well.

If the examination of fixed variables in the laboratory is just as unique as the investigation of fixed variables in the field then why is it that many environmental evaluation studies appear to be so idiosyncratic? The most obvious answer is that fixed environmental features are generally not conceptualized in more general theoretical terms. The specific, fixed variables that constitute the focus of inquiry in the laboratory usually represent operationalizations of theoretical constructs and are of interest in and of themselves. It is only when environmental evaluation researchers attempt to examine design features within a set of theoretical constructs that the similarities between laboratory and field oriented research will become clearer. The work of investigators who are attempting to develop a theoretical descriptive system for environmental qualities is designed to provide theoretical categories of relevance to the unique sets of design features encountered in settings such as hospitals, homes, offices and so on.

Thus, the fixed components of an office setting may be conceptualized in terms of their role in information flow through the system. An office worker's evaluation of a partition system may then be assessed for its effects on various sensory information flows through the office and not just in terms of the partitions qua partitions.

Replication, Repeatability and Diversity in Case Studies

A criticism that is related to the uniqueness problem in case studies concerns the exhaustiveness of description that typically characterizes many environmental case studies. If the intent of the case study researcher is to describe the full range of variables characteristics of a setting and to show how these variables considered separately and in combination affect behavior and experience, the sheer number of variables can rapidly exceed the number of people in the setting. Under those circumstances, the majority of classical quantitative techniques cannot be used to estimate the effects of the variables on the behaviors and experiences of the setting's users. Since the design features of a setting remain generally constant, we need to consider how many observations are required in order to obtain numerical estimates of their effects upon the users.

There are two components to this problem. The first involves the number of observations and the second the extent to which they are statistically independent of one another. It is important for the case study researcher to realize that it is the number of observations that is the critical feature of the case study and not necessarily the number of people involved. In many settings of a public or quasi-public nature (e.g. airport waiting rooms, streets, museums, hotel lobbies and so on), there is sufficient turnover of people to provide sufficient observation points to assess various components of the setting that are considered to influence behavior. Thus, it is possible to examine a wide range of environmental patterns within these settings quantitatively. In our study of orientation problems in the Museum of History and Technology at the Smithsonian we relied upon turnover in the users of the environment to assess a large number of different environmental factors that we assumed influenced orientation (Winkel et. al., 1977). Thus,
we could replicate our data and determine how well the environmental changes we introduced operated to improve orientation.

There are a number of instances in which the users of the environment remain the same, however. For example, the same workers in an office setting, children in a playground or patients in a hospital ward may be observed repeatedly. In these cases, we may perform repeated observations of behaviors in these environments. Here, however, we cannot assume that the observations are necessarily statistically independent of one another. Once again, classical analytic procedures cannot be used if they rest upon the assumption of independence of observations. For example, we are currently working on a problem in a ward for post-surgical patients. Staff wishes those patients who are capable of ambulatory behavior to move about the ward as much as possible since this will hasten recovery. Various types of environmental changes are being considered for the ward in an effort to motivate the patients to become more active. Assume for a moment that we introduce the changes and we simply count the number of patients who are active before and after the change. Can we add together the number of active behaviors we have observed before and after the change and compare them? Not if these observations are not independent of one another. It could be that the same small set of patients are active from one observation period to the next. After the change is introduced, this small set of patients show more active behaviors. It is they who are contributing to the differences prior to and after the changes. Compared to the total number of patients who might be able to move about, there could be no differences between the pre- and post-change conditions. That is, the changes would not necessarily increase the total number of patients who were moving about the ward. This problem becomes even more complicated if the patients are exposed to different environmental conditions (for example, some are assigned to bedrooms with four patients while others are in rooms with only two patients, some patients are in bedrooms that are a farther distance from where the environmental changes are to occur while others are near to the changes that are presumed to be motivating them to move about and so on).

Under these circumstances, it is possible to observe people in settings who are exposed to different environmental conditions over time and use the resulting data within a time series framework (Box and Jenkins, 1976; Box and Tiao, 1975). While these analytical procedures require a minimum of 50 observations before they can be employed, it is easy to see that when we do observations over time it is relatively easy to generate 50 observations periods (e.g. observations over 50 days in the ward or in the playground). Where the procedure can be time consuming, of course, occurs in those cases in which the behaviors may be influenced by factors that occur infrequently over time (e.g. seasonal changes, holidays and so on). Nonetheless, the potential for examining the same people over time within this framework could introduce a number of possibilities for the case study investigator who is concerned about the problem of the need for more observations than there are variables to be tested or where the study design requires repeated observations over time.

In the case of the post-surgical ward we are proceeding with the analysis based upon the percentages of patients who are the same users of the environment and the percentages who are different users of the environment. In both instances, we do not need to assume that the observations are statistically independent and indeed in the first instance such an assumption would be unwarranted. Yet, we believe we can obtain estimates (reliable) of how the existing and changed environment will influence the observed behaviors.

Causal Arguments Within the Case Study Framework

The last criticism of the case study to be considered concerns the ability of the case study researcher to make causal arguments about the effects of certain environmental variables on observed behavior and experience. This is, no doubt, the most difficult criticism to address.

To place this problem in perspective it is instructive to compare the field study to the laboratory. Within the latter setting, the investigator typically can vary the factors of interest in the study and through random assignment of participants to experimental condition may rule out variables that may be relevant to the outcome but irrelevant to the conceptual system being evaluated in the research.
The key elements that constitute the power of the laboratory experiment are variation or, more generally, contrasts among conditions, the postulation of mediating variables linking conceptual scheme to experimental condition and then to outcome and the utilization of randomization. It is important to realize that case studies can sometimes match or approximate these conditions.

Of the elements described above, the most important involves the postulation of mediating conditions that might affect the outcomes of an investigation. It is the mediating conditions that guide the choice of contrasts or comparisons that the researcher employs in an effort to understand how the setting works. For example, suppose a design researcher finds that in a school for developmentally disabled children there are differential amounts of aggressive behavior shown by the children. He or she further finds that the design of different parts of the school appears to be correlated with aggressive outbursts. More specifically, when design elements appear to interfere with goal directed behavior, aggression typically occurs.

If the researcher assumes that it is goal blockage which leads to frustration and thence to the expression of aggressive behavior, he or she is postulating a mediating explanation that guides the choice of comparison conditions within the setting. It is assumed that goal blockage is the critical element and not differential assignment of children to classroom or some other variable that mediates aggressive outbursts. As Miller (1971) pointed out, if we hypothesize that some set of conditions (Z) activate a mediating mechanism (X) which in turn is linked to an outcome (Y), the logic of experimentation rests upon two assumptions:

1. That Z, a cause of X (the mediating mechanism) does not cause Y (the outcome of interest) except by virtue of its operation through X; and

2. Z is not related to any unmeasured causes of Y that do not operate solely through X.

Miller then notes that "These two assumptions... not the fact of manipulation of variables per se are the core of experimental logic" (Miller, 1971: 276). It is important to recognize that case study research can often allow the investigator to locate comparison or contrast conditions within the setting which will allow the possibility of causal argument. The choice of comparisons, however, must be guided by the postulation of the mediating mechanisms that presumably account for the outcome. The case study investigator needs to be aware of the possibilities for seizing upon irregularities in the environmental context within the setting to set up comparisons that will illustrate how the setting "works".

In order to do this successfully, careful analysis of the outcome of interest is required. This involves the analysis of plausible alternatives that could account for the outcome but which are not related to the mediating mechanism involved. For example, if aggression prone children were assigned to classrooms in which the design interfered with goal attainment, there would be a confounding of aggression proneness and design condition. This condition would violate the first of Miller's assumptions listed above. It is possible, however, that presumptively aggression prone children would come into contact with different parts of the school that might vary in the extent to which the design interfered with goal attainment. If these children did not exhibit aggression under those circumstances, the investigator might have slightly more confidence that it was the design and not aggression proneness that prompted the aggressive outbursts. Thus, the task for the case study researcher is to search out comparison conditions within the setting that result in variations of some factors but not others guided by the assumptions that Miller suggested.

CONCLUSION

Space unfortunately does not allow the exploration of the challenges and promises of the case study more fully. On the basis of the discussion, however, I hope to have suggested that case study investigation is not just an inferior substitute for laboratory study. As a matter of fact, the case study methodology may be required for the types of problems confronted by environmental researchers particularly if one is concerned with the ecological validity of the study (Winkel, forthcoming).
REFERENCES


MEASURING COGNITIVE MAPS: METHODOLOGICAL CONSIDERATIONS FROM A CARTOGRAPHIC PERSPECTIVE

Nathan Gale
University of California, Santa Barbara

ABSTRACT

In the study of environmental cognition an often used construct is the "cognitive map." Problems related to the externalization and study of this abstraction are many. This paper looks at some of these problems from a cartographic perspective by focussing on the measurement, portrayal, and analysis of error in subjective configurations derived from the multi-dimensional scaling of proximity estimates. A distinction is made between the distortion (accuracy) and fuzziness (precision) associated with the subjective location of places in the environment. An empirical study gives evidence for maintaining this distinction.

BACKGROUND

A "cognitive map," as defined by Downs and Stea (1973), p. xiv), "is an abstraction which refers to a cross-section, at one point in time, of the environment as people believe it to be." Among the fundamental problems of using this construct, "cognitive map," as a model of environmental cognition is the question of how to describe and measure such an abstraction. Clearly, to speak of "the environment as people believe it to be" implies that people have knowledge, or some kind of mental representation, of the surroundings in which they live; and it has been recognized that part of this representation involves memory of the spatial layout (i.e. the relative locations) of places. In studying this aspect of spatial knowledge many researchers have, at one stage or another in their investigations, utilized some kind of two-dimensional map-like configuration.

INTRODUCTION

Over the past two decades the question of how people acquire, represent, and process information about the environment has attracted much attention. One of the most remarkable features of this concern with what is often called "cognitive mapping" is its truly interdisciplinary nature. Few areas of research engage the interest and efforts of at least some investigators in as wide a variety of fields, including environmental psychology, cognitive psychology, cognitive science, computer science, artificial intelligence, education, linguistics, anthropology, sociology, geography, architecture, design, and planning. From this broad spectrum of researchers comes a wealth of perspectives and methods of inquiry, the potential of which is only beginning to be tapped. This paper will explore some possibilities of one such perspective in an attempt to apply cartographic procedures to the analysis of subjectively generated "maps" of the environment. In particular, the focus will be on the measurement, portrayal, and analysis of error in configurations derived from proximity estimates.
would be naive to assume that the subjective configurations, or external "cognitive maps," that often appear in the literature, and that researchers analyze, are the same in every respect as the internal "cognitive maps," or actual spatial knowledge structure, that people use to make decisions directing spatial behavior. It is hoped, however, that such subjectively generated external data reflect some of the properties inherent to the internal representation of the environment.

Secondly, the limitations of cartographic display are well known to those who have tried to portray an almost spherical planet, or a complex pattern of interactions, on a flat piece of paper; and there is no reason to expect the portrayal of the subjectively surveyed terracognita to be any less difficult. Indeed, some of the properties of cognitive maps (perhaps the more interesting ones such as nonlinearity and asymmetry) cannot easily be shown using a simple two-dimensional Euclidean configuration of points. Nonetheless, what can be learned from each analytical tool, including such "maps," should be fully explored before the tool is discarded. With this in mind, and because many researchers from a variety of disciplines continue to use cartographic displays as summaries of data representing the spatial knowledge of subjects, we will investigate the question of location error in cognitive configurations of this kind.

MEASUREMENT OF ERROR

Although in common parlance the words "accuracy" and "precision" are often used interchangeably when speaking of error, in the context of technical measurement they must be defined with more care. Accuracy refers to the amount of bias in a measurement; it has to do with noncompensating, or systematic, error. In addition, accuracy by definition involves a relation to some "actual" value that has been measured by another means or is in some way "given." Precision, on the other hand, refers to unsystematic error and the amount of variability, or range of values, in a measurement. It describes the degree to which repeated measurements of the same thing yield similar results. Precision has nothing to do with deviance from an actual value; rather, it involves the relationships within a set of measurements themselves, or in other words, the variance about a measure of central tendency.

If subjectively generated maps of an environment are to be described in terms of error, the distinction between different types of measurements of error should be clearly delineated and maintained. One type of error measurement (accuracy) has to do with how well a given set of experimental data reproduces an "actual" or "objective" model of the environment; another type of measurement (precision) relates to the inherent consistency of the data. The importance of explicit definitions of error in this context derives largely from the fact that such error measures are often related to other "explanatory" measures of individuals, groups, locations, or environments in attempts to understand, or "explain," cognitive maps. Theories of environmental cognition have to do with how, and how well, a spatial context and spatial relations are known. It is crucial, therefore, that measures which purport to describe environmental knowledge be appropriately defined. In this regard the measurement of accuracy, or systematic error, is one approach, but perhaps a more complete understanding of experimental results could be gained by also examining the question of precision and unsystematic error.

It has been a common feature of many studies of cognitive maps to define error strictly in terms of accuracy by measuring the amount of deviance from an objective location or map. In contrast, although raised by Tobler (1976), the question of the precision of estimated locations has remained, for the most part, untouched. Evans (1980) points out that although aggregate descriptions of sets of individually generated data are often given, the variability associated with such mean or modal maps is often unreported or cannot be adequately determined. Furthermore, Garling et al. (1981, p. 69) state that "nothing appears to be known about the degree of precision the memory representation (of the spatial layout of the environment) possesses." The conspicuous absence of research in this area is unfortunate in that it may well be that precision is as important as accuracy to the empirical and theoretical study of cognitive maps.

The specific purpose of this study, therefore, was to make a preliminary exploration, at an aggregate level, of location error with respect to both accuracy and precision. With this aim, the first step was to define accuracy,
or distortion, to be the average displacement of a location from its actual position, and precision, or fuzziness, as the areal dispersion of a sample of subjectively estimated placements of a given location. Three basic objectives were then delineated to guide the investigation. The first was to find an acceptable way to measure and portray both the distortion and fuzziness of each of a set of locations. Once this was accomplished, the second objective was to examine the relationship between these two measures. Finally, the third objective was to examine relationships between these measures of error and other independent variables in an attempt to discover theoretically relevant personal and environmental correlates to cognitive mapping results.

In this regard one of the most studied personal, or subjective, variables has to do with the notion of familiarity. Several researchers have attempted to relate levels of familiarity to measures of error with mixed success. In addition, some efforts have been made to relate familiarity effects to developmental stages such as those outlined by Piaget (see Evans, 1980). For these reasons a correlational analysis was carried out between the error measures as defined above and average subjective familiarity ratings. With respect to environmental factors, distance and directional variables were defined in relation to the focal point for most theoretical descriptions of city structure, i.e. the Central Business District. These variables, in turn, were also examined for relationships with measures of error derived from the results of a cognitive mapping experiment.

DATA

The data used in this research were collected in conjunction with the N.S.F. project (#GS-37969) "Cognitive Configurations of the City" (Golledge and Rayner, 1977). The project, designed to explore cognitive images of an urban environment, was conducted at the Ohio State University and used Metropolitan Columbus as the study area. Forty-nine location cues (shopping centers, intersections, public buildings, etc.) were chosen based upon their familiarity and dispersion over the area. Subjects were asked to make paired comparison judgments about the proximities between location cues; they assigned scaled scores from '1' to '9' to indicate the degree of cognized separation between pairs of places. Due to the time consuming nature of the task only a subset of all possible pairs was used. In addition to the proximity data subjects gave locational familiarity ratings which were aggregated over the sample to yield average familiarity scores for each cue. More detailed descriptions of the complete data set, its collection, and previous analyses, can be found in the works of Rivizzigno (1976), Golledge and Rayner (1977), Spector (1978), and Richardson (1979).

The specific data used in the present study consisted primarily of two-dimensional "cognitive maps" for 107 subjects. Each of these subjective configurations were, in fact, a set of x, y coordinates describing estimated positions for the forty-nine location cues. These were derived by performing multidimensional scaling procedures (Kruskal, Young, and Serry, 1973) on the pairwise judgments to yield a set of output location coordinates such that the spatial relations among these coordinates reflected the original subjectively estimated proximities. Subsequently, each subjective map was rotated and standardized to enable comparison to an objective model configuration, describing the actual locations of the forty-nine cues (Oliver, 1970). Thus, each cue could be identified by an actual map location and 107 subjectively estimated locations.

METHOD AND RESULTS

To accomplish the first objective -- that of measuring and portraying the distortion and the fuzziness associated with each location cue -- computer cartographic techniques were employed. Since these procedures have been described in some detail elsewhere (Gale, 1982), only a brief sketch will be presented here. A modified version of Tobler's (1970) "Standard Deviational Ellipses" program was used to plot all of the estimated locations of each cue, the mean center, and a standard deviational ellipse of the estimates. The actual location of the cue was then drawn, as well as a displacement vector from the actual location to the mean center of the estimates.

The mean center represents the average of the subjective location estimates, and thus removes the effect of unsystematic error to enable the measurement of systematic error. Hence, the displacement vector associated with each cue describes the systematic relationship
between an actual location and a set of subjective estimates of that location. The length and direction of the displacement vector were, therefore, used as measures of the sample distortion of each location cue.

The standard deviational ellipse, on the other hand, describes the areal dispersion, or unsystematic error, in the estimated locations. It is derived from the covariance matrix of the coordinates of the subjective locations for each cue. The first characteristic root, or eigenvalue, defines the amount of "stretch" along the axis of maximum variance, while the second eigenvalue is associated with the axis of minimum variance. Taking the square roots of the eigenvalues gives the lengths of the semi-major and semi-minor axes of the standard deviational ellipse. In this study the area of the ellipse for each cue was used as a measure of the fuzziness associated with that location. A directional measure of dispersion was obtained from the inclination angle of the major axis of the ellipse.

Figures 1 and 2 illustrate the results of the cartographic portrayal procedures. In the former case (cue #6) most of the subjects placed the cue within a fairly small area, but there was a strongly pronounced systematic shift away from the actual location. Thus, relatively speaking, the cue was precisely, but not accurately, located by the sample of subjects. In the latter case (cue #29) an opposite situation was found; the cue was on average accurately placed, but not precisely so. A composite configuration including the displacement vectors and error ellipses (at one quarter size) of all forty-nine cues is shown in Figure 3.
Figure 3
Having obtained measures for distortion and fuzziness, it was possible to proceed with the second objective -- an investigation of the relationship between these two components of error. In this regard, both magnitude and direction were considered. The correlation between the length of the displacement vectors and the areas of the standard deviational ellipses was found to be 0.27 (not significant at 0.05). In addition, using a modified version of the Rayleigh test (Mardia, 1972) no significant relation (at 0.05) was found between the angles of the displacement vectors and the major axes of the error ellipses.

These results indicate that the theoretical distinction between distortion and fuzziness can be supported at the empirical level. Convolution of the two types of error measurement may potentially lead to ambiguous or misinterpreted results, and hence it would seem beneficial to study and analyze them separately. Furthermore, concentration on one to the exclusion of the other may mean leaving a significant aspect of subjective environments unexplored.

Finally, relations with average subjective familiarity ratings and position with respect to the downtown CBD were examined. Results of the correlational analysis of magnitudes were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Distance from CBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td></td>
</tr>
<tr>
<td>Distortion</td>
<td>0.06</td>
</tr>
<tr>
<td>Fuzziness</td>
<td>-0.69*</td>
</tr>
</tbody>
</table>

*Significant at 0.01

In terms of the directional component of distortion, a significant relation (at 0.01) was found between the angles of the displacement vectors and radial axes from the CBD. Furthermore, locations on the periphery of the city were displaced inward, while those close to downtown were displaced outward. With regard to fuzziness, some evidence (at 0.05) was found for a preferred scattering of estimates along a basically east-west axis.

DISCUSSION

The findings from this study suggest that when measuring error in externalized configurations that purport to represent spatial knowledge, both the distortion and fuzziness of such "maps" should be considered. How "well" a place is known by a sample of subjects involves both how accurately and how precisely it can be located. At the aggregate level of this study no strong relationship was found between these two measures of error in either a magnitudinal or directional sense. Furthermore, accuracy and precision were found to have quite different relationships with an "objective" (physical) as opposed to a "subjective" (psychological) variable. Accuracy was significantly related to distance from downtown, but not to judged familiarity, while the reverse was true for precision. This may imply that distortion in aggregated cognitive configurations has more to do with physical aspects of the environment, while fuzziness, or the lack thereof, has more to do with subjective interaction with the environment.

A full justification for such an assertion would require more research, but it does not appear, at this stage, to be entirely implausible. It is at least conceivable that systematic distortion may be common to a large number of subjects due to properties of the physical environment such as the type of development, or the particular layout of a transport system. For example, distances might be cognitively shortened in areas of low density homogeneous land use. Another potential source of systematic distortion could be a common tendency to misjudge directional irregularities in streets, or to conceptually simplify all intersections to right angles when some may be obliquely aligned. Thus, even a place which is quite familiar to a sample population could be inaccurately located. On the other hand, if a place is not very familiar to a given group of subjects they perhaps would be inclined to guess at its location, and under these circumstances individual variation among subjects could tend to yield imprecise results, although the average of the estimates may be quite accurate.

No immediate interpretation of the east west directional bias of fuzziness is apparent, but the directional bias of distortion along radial axes from the CBD may well be related to a predominantly radial transportation structure and consequent sectorally biased mobility patterns. It might also be postulated that the distortional expansion of the center and contraction of the periphery may be connected in some way to the varying density of imagable, or notable,
features in the landscape. The validity of such speculations, however, must await further and more detailed study.

Perhaps the most interesting and rewarding extension of this work from a theoretical point of view, would be to examine similar measures and relationships at a disaggregate level. It is only at this level that valid connections to developmental and/or learning theories could be made. In order to do this one would need data with sufficient redundancy for the measurement of both accuracy and precision. One way this could be done would be to collect multiple sets of data from each subject through repeated experiments. Another possibility in a pairwise comparison context would be to ensure that the data included estimates from each place to all, or at least a sufficiently large number, of the other places. However it is done, the assessment of precision requires repeated measurements of some kind, and this increases the burden on both the subject and the researcher. The extra effort, however, may yield new understanding of the structures and processes of environmental knowledge.

In conclusion, this paper has attempted to emphasize that in studies of subjective environments we are not measuring "real" cognitive maps, but rather the ability of subjects to respond in such a way as to externalize some aspects of an internal representation of their surroundings. Moreover, we reiterate that if spatial knowledge is to be measured, portrayed, and analyzed in geometric terms then the distinction between knowledge as a reproduction of some "actual" environment, and knowledge as the clarity and consistency among conceived spatial relations must be maintained.

REFERENCES


Olivier, D. Metrics for Comparison of Multidimensional Scaling. Unpublished Manuscript, Department of Psychology, University of Illinois, Urbana.


1.3

EMPIRICAL INVESTIGATIONS
FACTORS INFLUENCING ELDERLY WOMEN'S DECISIONS CONCERNING LIVING-ROOM ITEMS DURING RELOCATION

Mary Kalymun
University of Rhode Island

ABSTRACT

Researchers have underestimated the importance of decisions concerning household possessions as a factor among the elderly that may influence adjustment to relocation. The purpose of this study was to examine factors influencing the decisions of elderly women concerning their living-room items during relocation. The 36 participants in this study were 62 years of age and older, living alone in one-bedroom apartments with identical floor plans, and had relocated within one year prior to the time this study was initiated.

A structured focused interview was used to collect the data. Background information concerning participants was gathered and hand-recorded. Factors influencing decisions concerning living-room items were investigated through a series of open-ended questions. Responses to the questions were tape-recorded, transcribed, and content-analyzed.

Factors that influenced decisions to eliminate, retain, and acquire furniture, accessories, and decorative items were identified. They were classified into two general domains: environmental and personal. Various factors and various combinations of environmental and personal factors were found to influence decisions concerning living-room items.

INTRODUCTION

Relocation is considered one of the most important events associated with elderly people. It involves the expenditure of limited resources in order to achieve successful adjustment to new living arrangements (Mathieu, 1976). Also, it requires elderly people to evaluate the importance they place on their possessions by making decisions about them during relocation. By identifying reasons for decisions concerning household possessions during relocation, architects, interior designers, related housing personnel, and social service providers will be better able to accommodate this clientele in various types of settings. Furthermore, the identification of priorities will provide information and baseline data to practitioners for the future design and management of living arrangements for elderly people. Practitioners will be better able to assist residents in making positive adjustment to new living arrangements by developing an awareness of, and sensitivity to, individual needs and preferences.

Previous research concerning adjustment to relocation has focused on the voluntary nature of the move, and active participation in the decision-making process (Beaver, 1979). However, no attention has been given to decisions concerning household possessions as part of relocation and adjustment to a new setting. The intent of this study was to identify causal factors that influence various decisions among elderly women concerning living-room items during relocation.

The identification of reasons for decisions will provide a basis for understanding interactions between environmental and personal influences in the decision-making process. Furthermore, an awareness of a motivational basis for decisions will generate insight for adjusting to and establishing control in a new living arrangement. More specifically, however, a study concerning women will contribute to understanding differences that may exist between elderly females and males concerning their decision about household possessions during relocation.

ELDERLY PEOPLE, DOMESTIC SPACE, AND HOUSEHOLD POSSESSIONS

Relocation for elderly persons generally involves adjustment to a smaller living space, such as from a house to an apartment. For elderly persons, the accumulation of a substantial amount of furniture over their lifetime presents problems both in terms of space and safety when
moving into new and smaller living arrangements (Lawton, 1975; Howell, 1980b). This problem is further complicated by the fact that, out of necessity, the elderly are forced to take much of what they own with them because of limited economic resources (Lawton, 1970), and the inability to replace their possessions with new items.

Since people spend more time in their living arrangements as they grow older (Howell, 1980b), decisions about household possessions become all the more important. Previous research, however, suggests that males and females tend to differ in their associations with living space and the items therein (Csikszentmihalyi, 1981; Hayward, 1977; Loyd, 1975; Oury, 1978; Tognoli, 1980). Howell (1976) reported sex differences with regard to the choice of possessions retained during relocation. In the case of widowers, she observed that they brought few objects of attachment or furniture to a new location while women kept as much of the old furniture and memorabilia as possible. Consequently, the surroundings of older women appeared to be cluttered and overcrowded. Males, on the other hand, were content with having the bare essentials: bed, dresser, chairs, and a table for eating. It was not unusual to find that in the case of some men, several rooms were vacant.

Cooper (1976) found that in the more typical settings, bedrooms appeared functional and less decorative, but living rooms represented a collective identity. Families housed their best furnishings, momentos, art pieces, and photographs in the living room which was set aside for receiving family, guests, and relatives. Laumann and House (1972) indicated that furnishings and items of decor in the living-room area provided clues to the occupant's status and attitudes. It became the area where performance for guests occurred, reflecting the individual conscious and unconscious attempts to express social identity.

Although elderly persons are prepared to reduce the amount of their belongings when they move to a new place, bringing part of their former lives with them helps them feel "emotionally whole" (Architectural Record, 1979, p. 76). Schmitt, Redondo, and Wapner (1977) found more significant and optimal functioning in elderly people who took transitional objects from their old homes to nursing homes. They indicated that these personal possessions serve as anchor points and function as transitional objects following relocation. This suggests that a family can move from one environment to another and feel relatively "at home" once the furniture and possessions have arrived. Likewise, hospitalized individuals are comforted by having personal objects about them which serve as reminders of home (Altmann, 1975, p. 108). Evidence suggests that encouraging individuals to retain personal possessions when moving into an institutional setting resulted in positive attitude formation and successful rehabilitation. "It is as if possessions permit a healthy degree of personal control or competence in a relatively uncontrollable environment and thereby foster positive attitudes and adaptive behavior" (Furby, 1978, pp. 324-325).

Howell (1980a) further discusses the importance of familiarity with possessions in the living arrangements of older adults. She suggests that bringing part of the past to a present setting provides a basis for self-identity since the significance of possessions is fundamental to self-perception. In a national study of older people in residential settings, Howell found that they frequently made statements about themselves through personal displays of possessions. These items represented an environmental past with people, places, and objects. While it is yet unclear as to why older people become attached to environmental surroundings and objects, there is evidence to suggest that familiarity and meaningfulness become increasingly important with age.

While examining factors that influence the choice of possessions during relocation, it is helpful to understand the nature of possessions and the motivational basis for ownership. Furby (1978) maintained that the explanatory variable for the acquisition of property is due largely to control. Individuals continually need to feel competent in ordering their environments (Proshansky, Ittelson, and Rivlin, 1970) to meet their personal needs and preferences. Part of this control is exhibited through the procurement of possessions, the decisions for which are reflected by personal values at a particular stage of the life span.

Furby (1978) examined the nature of possessions and the motivational basis for owning material objects. Regardless of age, subjects interpreted the meaning of possessions as "control over the use of an object" (p. 312). Material objects
were seen as vehicles which provided ac-
tivities and enjoyment to the owner, a
defining characteristic which become more
pronounced with age.

Possessions have an instrumental function
since they are a means to an end. Furby
and the following reasons for securing
possessions: to control the environment
for desired outcomes, to satisfy a per-
sonal need for the object (decreased with
age), to insure social power and status--
reth (increased for older subjects),
and to maintain one's personal identity--
self image. Each of these reasons testi-
fy that possessions are related to the
need for control.

DESIGN OF STUDY

A special characteristic of this study is
that it focused on a population of eco-
nomically disadvantaged elderly women who
lived alone in a permanent living ar-
rangement (i.e., house, apartment) and
moved to a federally subsidized housing
facility. The purpose of this study was
to identify factors that influenced vari-
ous decisions among women concerning
their living-room items when relocating.
Such relocation involved a change in res-
idence to a one-bedroom apartment for in-
dependent living in a HUD low-income
housing facility for retired people.
Factors that influenced decisions about
living-room items during relocation were
identified through a structured personal
interview which served as the means of
data collection. The research design and
data analysis attempted to strike a bal-
ance between being open to the emergence
of new ideas from the data and being
guided by significant concepts from the
literature.

Description of Subjects

The subjects of this study were women,
62 years of age and older, in good physi-
cal and mental health, economically dis-
advantaged, and living alone in identical
apartment units in a small town in cen-
tral Pennsylvania. Selection of a single
housing facility was based on the princi-
ple that during the exploratory stages of
research it is important to minimize cer-
tain differences among respondents
(Glaser and Strauss, 1967). Focusing on
a single housing facility would allow the
researcher to concentrate on differences
that emerged in this group. Furthermore,
this type of housing facility was se-
lected because it is typical of arrange-
ments secured by the elderly through fed-
eral funding.

All subjects moved to this housing facil-
ity within one year prior to the time
this study was initiated. It was assumed
that recency of the move would facilitate
greater accuracy of recall with regard to
the reasons that influenced decisions
about household possessions.

Development of Interview Schedule

In order to conduct this study, it was
necessary to develop an interview sched-
ule for determining the nature of deci-
sions concerning living-room items
during relocation. To begin the develop-
ment process, the researcher met with
eight women who were similar to the sub-
jects in this study with regard to age,
economic status, type of living arrange-
ment, and recency of the move. Each
woman was interviewed and the information
obtained from analyzing the content of
these interviews indicated that the women
focused primarily on three types of de-
cisions concerning their living-room
possessions during relocation: to elimi-
nate, to retain, or to acquire various
items.

Also, it was noted that reasons for deci-
sions were based on the functional qual-
ity of an item. For example, furniture
items were considered basic, necessary,
and useful. Women often referred to
these items by saying, "I can't do with-
out these things. That's why I have
them here." Other items were considered
unessential in themselves, but added to
the beauty, convenience, or effectiveness
of furniture items. For instance, one
woman remarked, "I just bought that wall
clock because it blends in nicely with
the rest of my things. Besides, I can
see the time while I'm in the living
room without having to go into the
kitchen or the bedroom." Other items
were identified as purely ornamental.
They had no function other than that of
decorating the interior space of the liv-
ing room. One woman referred to this
type of item by saying, "These knick-
knacks are just for show. They're nice
to have around but they're also dust
collectors. Someday, I'm going to pitch
them all."

In order to obtain and/or pinpoint the
real reason(s) that influenced a decision
about each item, probing questions had to
be used. Women did not reveal, in a
straightforward manner, their reasons for
making decisions about each item. Therefore, in order to formulate and develop a useful typology for grouping all expressions in a manner that was understandable and fulfilled the purpose of the study, each reason was analyzed thoroughly and was assigned to a certain type of reason, the members of which shared a common meaning. As a result of the above procedures, definitions were generated for each similar group of reasons. Each group was then considered as a factor influencing decisions concerning living room items. As a consequence, the term "factor," as it applies to this study, is defined as follows: any internal (personal) and/or external (environmental) reason(s) that determines, directs, develops, and influences decisions of elderly women, which reflects their personal values and/or attitudes toward living-room items.

Data obtained from interviews of the eight women suggested the various types of questions that should be asked in interviewing the 36 women of the central study. In addition, the analytical categories described above served in developing a provisional taxonomy to be refined upon interviewing the 36 women.

Research Method and Plan for Data Analysis

The method used for analyzing the interview responses to this study was content analysis (Carney, 1972). In order to apply this procedure to the unique characteristics and specific objectives of this study, units of analysis were established. A framework for determining units of analysis evolved from the responses of eight women who participated in preliminary interviews. The findings and definitions derived from these interviews became the basis for organizing responses (Kalymun, 1982).

Items were identified as those eliminated, retained, and acquired. The corresponding reason(s) for determining the decision about each item was recorded. Each item, with the corresponding reason(s) for the decision, was classified as furniture, accessory, or decorative item. Lastly, a taxonomy was developed resulting in a classification scheme of factors influencing all decisions about all items.

Method of Data Collection

A structured focused interview (Merton, Fiske, and Kendall, 1956) was formulated consisting of open-ended questions. The purpose of the open-ended questionnaire was to elicit as much information as possible without restricting respondents' answers, and to allow theoretical concepts and categories to emerge from responses (Glaser and Strauss, 1967). Interview questions focused on the decisions of elderly women to eliminate, retain, and acquire living-room items during relocation. The reasons for decisions concerning these items were examined and identified as factors.

Items observed in the living room were noted as items retained and/or acquired. Items eliminated prior to relocation were recorded as the subject reported them. The researcher made sure that each item was discussed in accordance with the information required by the interview questionnaire. In all instances, probing questions were used regularly and in accordance with the individual situation.

Following each interview, the tape-recorded segment was transcribed, typed, and organized in the same manner for each participant. Upon the completion of all the interviews with all the participants, responses to the interview questionnaire were subjected to a content analysis in accordance with an established framework. Five judges examined the interview responses of each participant and classified these responses in terms of the categories that had been defined. Inter-judge reliability (Holsti, 1969) of 0.89 was computed.

DESCRIPTION OF THE SAMPLE

All of the 109 eligible subjects for this study were contacted by the researcher. Of those, 36 women agreed to participate. The participants represented a self-selective sample. They were not a product of a random sampling procedure. Thus, there may have been an over-representation of certain types of people who were similar in some way to each other. Since the intent of this research was to generate categories and concepts that could be utilized and tested in further research, the possibility of bias due to a non-random sample was not considered a serious problem in detracting from the quality or importance of the information gathered.
Responses to general and background information indicate that the mean age of participants was 74.03 years. Although some women were divorced and others had never married, widows (83.3 percent) constituted the highest percentage of participants. Moreover, the women had lived in a variety of housing arrangements prior to their move to this facility. The highest percentage of participants had lived in unfurnished apartments (41.7 percent), as opposed to other living arrangements (27.8% houses, 16.7% mobile homes, 8.3% furnished apartments, and 5.6% living with relatives).

FINDINGS AND DISCUSSION

On the basis of the interviews with the 36 women, the categories that had been identified were further refined. A revised taxonomy of this organization is presented below.

Identification, Definition, and Classification of Factors Influencing Decisions

A. Environmental (External) Factors

1. Spatial:
   - Fits Spatial Dimensions of the New Living Room
     Any reason which is used in considering the proportion of items (height, width, depth) with the physical dimensions of the new living room.
   - Apartment Space Limitation
     Any reason for which items are selected to compensate for limited area in the apartment, i.e., sofa-bed.
   - Living Room Features and/or Limitations
     Any reason concerning the physical features of the living room, i.e., window size, space available for dining area, or the absence of certain features such as light fixtures.

2. Regulation:
   - To Meet Building Regulation
     Any reason concerned with the rules and/or regulations by the management of the building which prevents individuals from securing items unless they meet certain specifications.

B. Personal (Internal) Factors

1. Utilitarian:
   - Need to Use
     Any reason concerned with the functional (utilitarian) aspect of items and the mode of use to serve the purpose for which it was designed.
   - Comfort
     Any reason related to the enjoyment and satisfaction of items to meet a physical need.
   - Manageability
     Any reason concerning the ease of care and/or handling (i.e., moving, cleaning, lifting) of items.
   - Worn Out
     Any reason concerned with the condition of items whereby they cannot be used or function to meet the standards of use for which they were designed.

2. Intimate:
   a. Companionship:
      - Communication
        Any reason concerning items which reflect a need for companionship, contact with the outside world, entertainment, and/or information (i.e., television, radio).
   b. Sentiment:
      - Family Attachment
        Any reason concerning items which carry with them, through their physical presence, family sentiment which serves as a means for the continuation of family relationships and associations. Such items represent family heirlooms, and associations with family relationships (i.e., spouse, child, etc.).
      - Nostalgia
        Any reason concerned with sentimental value or represents a period in the past or irrevocable condition characterized by past memories.
      - Gift
        Any reason which carries with it a special feeling toward an item because it was given on a certain occasion by a friend or associate and not by a family member.
B. 2. c. Self-Expressive:
-Aesthetic
Any reason concerning a sense perception toward items which reflects a feeling of responsiveness to beauty, form, shape, design, color, or texture of the material from which it was made.

-Hobby
Any reason related to items which represent a regular activity engaged in for relaxation.

-Good Quality
Any reason pertaining to the worth of an item in reference to excellence of grade.

-Decorative Compatibility
Any reason concerned with the harmony of items with each other and/or with the general characteristics of the living room from a decorative point of view (i.e., wall color, carpeting, furniture upholstery, etc.).

-Religious
Any reason related to the value of an item which represents belief in a faith.

d. Temporal:
-Familiarity and Attachment
Any reason that reflects the development of a personal feeling and association with an item from its frequent and customary use over a long period of time.

-Old (Antique)
Any reason concerning items which are viewed from their historical importance.

-Desire for Something New
Any reason concerning individual preference for new things in order to generate a sense of freshness by their novelty.

The findings, represented by this taxonomy, indicate that decisions to eliminate, retain, and acquire living-room items during relocation among elderly women were influenced by environmental and personal factors. Results showed that women considered various aspects of the physical setting to which they moved. In most instances, they visited the facility prior to relocation and in others, women were guided by the floor plan while assessing the physical characteristics of the new space.

Primarily, in the case of furniture items, women showed a concern for the extent to which space and scale of items complimented one another. Howell (1980b) observed that the scale of furniture was often too large for the space provided in a new setting. Also, women attended to the limitations of space in the apartment by selecting furniture that would compensate for such limitations. For example, most subjects retained or acquired a sofa-bed for the living room so that they could accommodate overnight guests while having a one-bedroom apartment. While making decisions, women were influenced by the presence or absence of physical features in the apartment. Availability of natural light, through sliding glass doors, encouraged many women to retain or acquire free-standing shelves to display and cultivate plants. On the other hand, the presence of sliding glass doors limited the options for arranging furniture. The absence of light fixtures was noted. Therefore, decisions concerning these items were made in accordance with the individual's anticipated needs in the new setting. Also, women frequently purchased a small table with chairs for eating purposes, since the space available for this activity would not accommodate larger formal furniture. These findings concur with Howell's (1980a) observation that formal dining sets are among the most frequently eliminated items during relocation in later life.

Although the influence of building regulations on decisions was not a major factor, it was noted while making decisions about window coverings. Tenants were required to hang draperies in accordance with certain specifications (white lining) in order to create a uniform appearance on the exterior of the building.

Personal factors influencing decisions were categorized as utilitarian and intimate. Women clearly assessed items in terms of their usefulness in the new setting, comfort, manageability, and condition. Intimate factors were described as a need for communication with the outside world, as through the use of a television, radio, or some other item. Additionally, they emphasized the importance of sentiment toward items because of family relationships, past experiences, and friendships. The decision to secure items was encouraged when the item represented an inherent self-expressive
ality to the owner. For instance, items were retained and/or acquired when the owner regarded them as being beautiful, a vehicle for self-expressive activity (hobby), for excellence of grade, for their decorative compatibility with other items, or for their religious significance.

Finally, women were influenced by temporal factors while making decisions about their possessions. They found it important to retain items because of their familiarity with, and attachment to, certain things. Some women considered the historical importance of items, while others placed a priority on the desire for something new.

CONCLUSION

These data suggest that decisions about household possessions during relocation are value-based, and are reflective of the individual's needs and preferences. Accordingly, individual needs and preferences respond to environmental and personal circumstances. Women are influenced by a combination of factors in their decisions to eliminate, retain, and acquire living-room items. Factors influencing decisions vary according to the functional quality of an item.

Decisions preceded by fewer environmental and personal restrictions provide individuals with greater opportunity to control new living arrangements (Kahana, 1975; Lawton, 1975). "...For many aged families and individuals the house is the major part of the environment over which they exercise a modicum of control" (Montgomery, 1972, p. 40). Decisions about household possessions, made in accordance with individual needs and preferences, reinforce control among the elderly. Therefore, it becomes essential that living arrangements enhance rather than inhibit freedom of choice. Satisfaction with decisions concerning household possessions during relocation may influence level of adjustment to a new living arrangement, and serve to strengthen a sense of place and a feeling of belonging in a new setting for elderly residents.

RECOMMENDATIONS

Since these results are the outcome of an exploratory study and are representative of a self-selective sample, further research, with random sampling, is suggested. The identification of factors that influence decisions among elderly people concerning their possessions in various types of residential and institutional settings can contribute to understanding the extent of control elderly people exercise in their domestic space. Also, the identification of factors that enhance and inhibit freedom of choice in such settings becomes necessary. These factors may differ depending upon the types of living arrangements to which individuals move. Since there is evidence to suggest that males and females relate differently to their domestic space and the items therein, it becomes necessary to examine the implications of these differences in facilitating sex-differentiated needs.

Practitioners are encouraged to become aware of priorities among elderly people in their choice of household possessions, and notice the types of items that they consider necessary. Spatial and structural accommodations for such items need to be considered by architects. Interior designers are encouraged to limit restrictions on the decision-making process by anticipating versatility in color of draperies, preinstalled wall-to-wall carpeting, and wall coverings. Furthermore, they are encouraged to assist clientele with recommendations to modify treasured items that meet personal needs in new living arrangements. Housing consultants are needed to assist elderly people by providing pertinent information about new living arrangements, and advising new residents in the decision-making process. Although various aspects of a living arrangement must be in accordance with the occupant's needs, often the items therein are considered to be more important than the larger environment.

REFERENCES


Hayward, G. Psychological concepts of home among urban middle class families with young children (Doctoral dissertation, City University of New York, 1977). Dissertation Abstracts International, 1977, 37, 5813B. (University Microfilms No. DCJ77-11173)


Howell, S. Recent advances in studies of physical environments of the elderly. Talk presented at the Environmental Psychology Program, CUNY Graduate Center, New York, April 29, 1976.


Laumann, E. and House, J. Living room styles and social attributes: Pattern of material artifacts in an urban community. In Laumann, Siegel, and Hodges (Eds.), The logic of social hierarchies. Chicago: Markham, 1972.


Post-occupancy study leads to insights on elderly housing. Architectural Record, September 1979, 69-76.


CONGREGATE VS. TRADITIONAL HOUSING FOR OLDER PEOPLE: DIFFERENTIAL PATTERNS OF BEHAVIOR AMONG RESIDENTS

Mary Ann Parris Stephens and Jennifer M. Kinney

Kent State University

ABSTRACT

In planning housing for active and independent older people, controversies have emerged concerning onsite services and design decisions. These controversies frequently center around the desired goal of creating environmental demands which will enable older people to both maintain independence and meet personal needs.

Two types of housing facilities, congregate and traditional, place different demands on residents. Congregate housing provides meals, housekeeping and medical services, while traditional housing leaves responsibilities for these services to individual residents. This study examined patterns of everyday behavior exhibited by residents of these types of facilities. Using time budgets, residents reported their behaviors, where these behaviors took place, and whether other people were involved. Analyses indicated consistency among the behavior of residents within each type of facility, however differences emerged in comparisons across congregate and traditional housing. Traditional residents engaged in more active behavior, largely due to the preparation of their own meals. In contrast, congregate residents engaged in more social behavior, largely due to their use of the public spaces within the facilities. This evaluation not only contributes to ecological theory, but also has implications for both planning and managing optimal housing for the active elderly.

INTRODUCTION

The past twenty years have witnessed rapid developments in planned housing for relatively healthy and self-reliant older people. These facilities often have been designed with the explicit aim of prolonging maximal independent functioning of residents and providing them with enriched social opportunities (Lawton, 1975). While planners and designers often have agreed upon the merit of these goals, there has been less consensus on the design features that will facilitate their attainment. Controversy frequently has centered on the levels of onsite services which should be provided to residents.

This controversy has some basis in theories of person-environment relations, which frequently argue that independent functioning is enhanced by environments which demand active behavior, and thus the presence of too easily accessed services might erode independence among individuals who are still competent. On the other hand, some social planners have suggested that managing daily living is difficult for most older people, and thus the easy availability of services would have an overall positive effect by making it possible for more personal needs to be met (Lawton, 1976). Reflecting this reasoning, the ecological model of aging proposed by Lawton and Nahemow (1973) predicts different outcomes for individuals with similar levels of competence who experience varying degrees of environmental demands. For those experiencing demands slightly above levels to which they have become adapted, functioning will be maintained or improved, while for those experiencing slightly lower demands, functioning may be mildly reduced, but there will be a corresponding increase in the gratification of their needs.

These issues illustrate the importance of designing housing that does not make excessive demands on the older person, but which also permits the attainment of personal goals and the maintenance of optimal functioning.

Two types of housing facilities for older people, congregate and traditional, differ in the degree of environmental demands placed on their residents. Congregate housing refers to facilities which serve meals in a common dining room, and which provide housekeeping and nursing services. Traditional housing refers to facilities composed of self-contained apartments in which residents manage their own meal preparation, housekeeping and medical services.
Previous research has indicated that older people moving from the community to congregate housing show increases in activity and satisfaction that continue over several years (Carp, 1978). Further research has reported no decline in activity or interactions with family and friends among individuals moving to facilities providing multiple levels of services. These people tend to interact more frequently with neighbors and express higher morale than those residing in traditional housing or those remaining in the community (Gutman, 1978). Additionally, older people with similar competencies moving either to congregate or traditional housing reveal differential changes in functioning over time. While residents of traditional facilities demonstrate greater increases in active involvement (e.g., reading newspapers, participating in organized activities), residents of congregate facilities demonstrate greater increases in morale and satisfaction (Lawton, 1976). These findings support in part the ecological model of aging and suggest that differences in onsite services may have far reaching implications for the everyday functioning of residents.

The purpose of the present research was to examine further differences in the daily behaviors of older people living in congregate and traditional housing. This study documents residents’ behaviors, their use of settings within the housing facilities, and their patterns of social participation. Particular attention was devoted to onsite services and architectural features as they impact the everyday behavior of residents.

**METHOD**

**Settings**

The daily behaviors of residents in two congregate housing facilities were compared to those of residents in two traditional facilities. All four facilities were multi-story buildings designed for relatively healthy older people, and were located in urban areas of the Midwest and Southwest United States. Each had comparable public spaces (e.g., a centrally-located lounge on the main floor), and specialized service rooms (e.g., laundry facilities, arts and crafts room). All facilities required residents to be fully ambulatory and independent in activities of daily living. When residents were no longer able to care for themselves, they were required to seek other housing arrangements.

In addition to the different onsite services provided by the congregate and traditional facilities (e.g., meal preparation and optional housekeeping services), these two types of facilities also differed on several architectural dimensions. The design of the central lounge areas and spatial arrangements for meal preparation and eating represented two of the major architectural differences. The congregate facilities had spacious, comfortably furnished main lounge areas, with small, intimate clusters of furniture, Game tables and a television were provided to encourage interaction among residents. The lounge areas in the traditional facilities were small, sparsely furnished, and functioned primarily as a waiting area for arriving visitors and mail delivery. In the congregate facilities, residents were provided two meals daily which were served in a common dining room. The traditional facilities had no central dining rooms.

In both the congregate and traditional facilities, the residential quarters were located along double-loaded corridors. In the congregate facilities, each residents' quarters was composed of two rooms, a bedroom and an adjoining bath. The bedroom also functioned as a sitting area and contained a kitchenette with a small refrigerator and a single burner unit enabling minimal food preparation. In the traditional facilities, each residents' quarters contained either one or two bedrooms, a bath, entry space, a living room and a fully equipped kitchen.

**Subjects**

A total of 17 residents was selected randomly from each of the four housing facilities, yielding a total of 34 subjects from each type of facility. The mean age of the sample from the congregate facilities was 77.0 (SD = 6.4), and the mean age of the sample from the traditional facilities was 74.0 (SD = 5.8). Tests of mean differences revealed a statistically significant difference (p \( < .025 \)) in the mean ages of the two groups. Females comprised 76.5% of the sample from the congregate facilities, while they comprised 91.2% of the sample from the traditional facilities. These
figures reflect the distributions of all men and women residing in the two types of facilities. All subjects were Caucasian and lived in single occupancy quarters.

PROCEDURE

Information on subjects' daily behaviors was obtained using retrospectively self-reported time budgets. Subjects were instructed to report a behavior if it was an overt activity (e.g., dressing, eating a meal, playing cards) and if it spanned at least five minutes. On designated days, subjects chronologically reported to a researcher behaviors occurring between 6 A.M. and 6 P.M., their beginning and ending times, location(s) where behaviors took place, and whether other persons were involved. For each subject, two time budgets were recorded. Data collection extended over a three week period in the summer months with four to five days elapsing between each subjects' two interviews. Interviews were scheduled so that no subject reported behaviors on consecutive days, nor reported behaviors twice for the same day of the week. Time budgets yielded data of high quality when compared to a) reports of subjects participating in the same activity (83.7%), and b) records of an independent observer (82.4%). In an independent assessment, these retrospectively reported time budgets also have been shown to provide valid and nonreactive accounts of behavior (Stephens, Norris-Baker, & Willems, in press).

RESULTS

Analyses of behavioral data involved a two step process. The first step compared patterns of behavior occurring within the two congregate facilities and the same analyses were conducted for the two traditional facilities. These analyses were performed to assess the degree of similarity in behaviors within a single type of facility. The second step compared behavioral patterns across congregate and traditional facilities. All analyses included only those behaviors taking place within the housing facilities.

Comparisons Within Housing Types

In order to assess the extent of similarity in behaviors occurring within each type of facility, the daily behaviors of subjects residing in the two congregate facilities were compared, as were those for subjects residing in the two traditional facilities. These comparisons included five dimensions of behavior: behavioral pace (number of behaviors reported), social interaction (proportion of behaviors involving at least one other person), level of activity (proportion of behaviors that involved gross motor activity), types of behavior (different kinds of behaviors, e.g., resting, watching television, doing laundry, sewing), and use of settings within the housing facilities (proportion of behaviors occurring within a given setting).

Using t-tests, a significant difference was found in mean values for behavioral pace between the two congregate facilities (p < .01), while no such differences were detected for the traditional facilities. In addition, tests of differences in means revealed no significant differences between the two congregate facilities or between the two traditional facilities on levels of activity or social interaction. To assess the degree of similarity in types of behavior, behavioral categories were ranked on the basis of the frequency with which they were reported in each facility. These rankings were compared using the Spearman rank order correlation coefficient, which provides an estimate of the association between two sets of rankings. This analysis revealed a high degree of correspondence in types of behaviors occurring in congregate facilities (r_s = .86, p < .01), and in traditional facilities (r_s = .89, p < .01). For each housing facility, categories of onsite settings were ranked on the basis of the number of behaviors occurring in each setting type. Rank order correlations indicated similarity in these rankings for congregate facilities (r_s = .66, p < .05), and for traditional facilities (r_s = .91, p < .01).

Comparisons Across Housing Types

With the exception of one statistically significant difference, all analyses of behavior within each type of facility indicated strong similarities in daily behavior. Based on these overall similarities, data for the two congregate facilities, and data for the two traditional facilities, were aggregated to enable comparisons across
the two types of facilities. These analyses first examined differences between congregate and traditional subjects' overall patterns of behavior, and then examined differences in their behaviors as a function of the different architectural features and onsite services of the two facility types.

Overall behavioral patterns. The five dimensions used to compare behavioral patterns of subjects within each type of facility also were used to compare patterns across types of facilities. Tests of differences in means indicated that the pace of behavior was slower for congregate subjects than for traditional subjects (p < .025). Since the two samples differed in age and gender composition, fixed order multiple regression analyses were employed to remove variance due to these demographic variables before examining contributions of the independent variable -- type of facility. While the overall model did not account for a statistically significant portion of the variance in behavioral pace (8.3%), after removing variance due to age and gender (1.9%), type of facility accounted for an additional 6.4% of the variance (F(1, 64) = 4.5, p < .05). Tests of mean differences indicated that congregate subjects interacted more frequently with others (p < .01) than traditional subjects. Using the regression model described above, the total amount of variance accounted for in social interaction by the three variables was 52.5% (F(3, 64) = 25.0, p < .001). Together, age and gender did not make a significant contribution (2.7%). The remaining 49.8% of the variance was accounted for by type of facility (F(1, 64) = 71.0, p < .001). Tests of mean differences indicated that traditional subjects engaged in active behaviors more often than congregate subjects (p < .005). The total amount of variance accounted for in the regression model was 23.8% (F(3, 64) = 6.7, p < .001). This analysis revealed that age and gender did not account for significant portions of variance (2.3%). Type of facility accounted for the remaining 21.5% of the variance (F(1, 64) = 17.9, p < .001).

Categories of behaviors within each type of facility were ranked according to the frequency of occurrence. Spearman rank order correlations indicated a strong correspondence (rs = .83, p < .01) in the rankings of these categories. The onsite settings common to both types of facilities were ranked according to the frequency with which behaviors occurred in each setting type. Table 1 displays the distributions of all onsite behaviors occurring within settings for both congregate and traditional facilities. The rank order correlation of .64 (p < .05) indicated similarity in the frequency with which settings were used. In other analyses, these settings were ranked according to the frequency with which social interactions took place in each setting type, and then according to the levels of activity they displayed. Rank order correlations indicated little correspondence between settings in congregate and traditional facilities for social interaction (rs = .42) and for levels of activity (rs = .19).

Thus, while congregate and traditional subjects engaged in the same types of behavior and used common onsite settings to the same degree, they tended to use the settings in different ways. In addition, congregate subjects demonstrated a slower pace of behavior, more social involvement, and fewer active behaviors than subjects residing in traditional facilities, even when factors of age and gender were considered.

Behavior in lounge areas. Analyses focusing on the main lounge area for each type of facility identified no significant differences in the frequency of their use by congregate and traditional subjects. While no significant differences were found in levels of activity, congregate subjects more often were involved in social interactions in the lounge (p < .01) than were their traditional counterparts. A rank order correlation of types of behaviors occurring in the lounge areas (rs = .72, p < .01) indicated overall similarity in the occurrence of different kinds of behavior.

Behavior in residential living quarters. In analyses of behavioral patterns in residents' own living quarters, tests of mean differences revealed that larger portions of traditional subjects' behaviors took place in these settings than those for congregate subjects (p < .001). A multiple regression analysis using age and gender as covariates and type of facility as the independent variable, accounted for a total variance of 41.4% of behaviors occurring in these locations (F(3, 64) = 15.3, p < .001). While age did not account for a significant portion of variance (1.8%), gender accounted for 4.6% of the variance.
Table 1

Percentage of Behaviors Occurring Within Onsite Settings

<table>
<thead>
<tr>
<th>Type of Setting</th>
<th>Congregate</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own Living Quarters</td>
<td>64.5</td>
<td>82.2</td>
</tr>
<tr>
<td>Dining Room</td>
<td>15.2</td>
<td>---</td>
</tr>
<tr>
<td>Main Lounge</td>
<td>6.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Other Residents' Quarters</td>
<td>2.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Hallway</td>
<td>1.4</td>
<td>4.5</td>
</tr>
<tr>
<td>Floor Lounge</td>
<td>1.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Staff Offices</td>
<td>1.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Auditorium</td>
<td>1.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Laundry Room</td>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Arts &amp; Crafts Room</td>
<td>0.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Patio/Yard</td>
<td>0.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Health Center</td>
<td>0.3</td>
<td>---</td>
</tr>
<tr>
<td>Other</td>
<td>4.0</td>
<td>0.4</td>
</tr>
</tbody>
</table>

(F (1, 64) = 5.1, p < .05). The direction of the bivariate correlation indicated that males engaged in fewer behaviors in their own living quarters than females. The remaining 35.0% of the variance was contributed by type of facility (F (1, 64) = 38.8, p < .001).

Tests of differences in means indicated that traditional subjects engaged in more active behaviors in their living quarters than congregate subjects (p < .001). These differences were due primarily to the preparation, eating and clean up of meals which accounted for 27.6% of traditional subjects' behaviors in their own quarters. In contrast, only 8.1% of congregate subjects' behaviors in these locations were so characterized. Congregate and traditional subjects did not differ significantly in the amount of social activity occurring in their own quarters. However, while differences in meal services fostered more active behavior by traditional subjects, these differences also were associated with traditional subjects eating more of their meals alone (p < .01). A rank order correlation of .77 (p < .01) indicated similarity in the frequency with which various types of behavior occurred in congregate and traditional living quarters. Table 2 presents distributions of types of behavior occurring in these locations. Although congregate subjects had housekeeping services available to them, there were no significant differences in the mean values for housekeeping tasks performed by traditional and congregate subjects. This finding may be partially due to the fact that traditional subjects often employed people from the community to assist with housekeeping.

These findings suggest that congregate and traditional subjects did not differ in the frequency with which they used the main lounge areas, but that traditional subjects more frequently used their own living quarters than their congregate counterparts. While congregate and traditional facilities displayed similarities in the frequency with which different types of behavior occurred in the lounge and living quarters, differences emerged along the dimension of activity level and social participation. Traditional residents engaged in more active behavior in their own living quarters than congregate subjects, while there were no differences between the two groups for active behavior in the lounge areas. Conversely, while congregate and traditional lounge areas did not differ in subjects' level of activity, the congregate lounges, which had been designed with more attention to social interaction, displayed more social behavior by subjects than did lounges in traditional facilities.

With regard to social behavior in the living quarters, congregate and traditional subjects did not differ substantially.

DISCUSSION

While the pace of behavior was slower in congregate housing than in traditional housing, the major differences in behavior were found in social involvement and in levels of activity. Residents of traditional housing engaged in physically active behaviors to a greater
Table 2
Percentage of Behavior Types Occurring in Living Quarters

<table>
<thead>
<tr>
<th>Type of Behavior</th>
<th>Type of Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Congregate</td>
</tr>
<tr>
<td>Grooming</td>
<td>21.7</td>
</tr>
<tr>
<td>Sleeping</td>
<td>14.8</td>
</tr>
<tr>
<td>Reading</td>
<td>13.8</td>
</tr>
<tr>
<td>TV/Radio</td>
<td>11.8</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>6.7</td>
</tr>
<tr>
<td>Handwork/Hobbies</td>
<td>5.2</td>
</tr>
<tr>
<td>Eating</td>
<td>4.5</td>
</tr>
<tr>
<td>Food Preparation</td>
<td>3.6</td>
</tr>
<tr>
<td>Writing</td>
<td>3.4</td>
</tr>
<tr>
<td>Visiting</td>
<td>3.2</td>
</tr>
<tr>
<td>Telephoning</td>
<td>2.6</td>
</tr>
<tr>
<td>Sitting Idly</td>
<td>2.1</td>
</tr>
<tr>
<td>Other (e.g., exercising, group activities)</td>
<td>6.6</td>
</tr>
</tbody>
</table>

This study, coupled with that reported by Lawton (1976), provides some empirical evidence for the ecological model of aging, and supports certain concerns of those cautioning against service-rich housing. These findings lend some credibility to the argument that easy access to services might diminish active involvement and foster dependency. On the other hand, these findings suggest that the provision of onsite services may offer residents increased opportunities for cultivating friendships and social support, factors shown to be important in the health and well-being of older people (e.g., Cohen & Sokolovsky, 1979; Stephens & Kinney, 1982). On the basis of this assessment, future research should begin to focus on those combinations of architectural arrangements (e.g., design of lounges and residential living quarters) and onsite services that foster an optimal balance between social participation and physical activity.

In this research, environmental differences in the two types of housing accounted for large portions of variance in the behavior of residents, and analyses ruled out residents' age and gender as plausible explanations for these effects. However, it is possible that other characteristics of residents not assessed here (e.g., health, functional mobility) might also explain some of the obtained findings, since personal preference and administrators' decisions might have placed certain kinds of people (e.g., the less able) in service-rich housing. Thus, services and architectural arrangements may not be solely responsible for all differences found in this
In addition to theory, this post occupancy evaluation has implications for both planning and managing housing for the elderly. For planners, it provides useful information regarding the possible behavioral impact of various design decisions. For managers, it could be used to anticipate the potential negative consequences associated with various housing designs, and to plan programs to alleviate some of these consequences, such as social isolation and inactivity.

REFERENCES


NEIGHBORS' PERCEPTION OF OUTDOOR SPACES SURROUNDING GROUP HOMES FOR THE DEVELOPMENTALLY DISABLED ADULT (1)

Dorothy I. Butterfield

Housing Research and Development Program and Department of Landscape Architecture, University of Illinois at Urbana-Champaign

ABSTRACT

The model for the care of the developmentally disabled has shifted from that of an institutional model to one where care is provided in a less restrictive setting. Therefore, people are being moved from institutional environments into smaller "group homes" within the community.

Each home is a residence for up to 20 persons. Some were specially built and some were adapted from other uses. They are located in neighborhoods of varying quality. An issue which has become of concern to organizations responsible for developing group homes is the ability to find neighborhoods which will accept a residence for developmentally disabled persons. Often the only information neighbors have about the group home is based upon the design of, and activities which take place in, the outdoor spaces. Unfortunately, little information is available concerning neighbors' perceptions and satisfaction with the D.O. group homes.

This paper presents information from an exploratory study which addresses issues related to neighbors' perceptions of the outdoor spaces surrounding group homes. It examines the relationship between these perceptions and satisfaction with the D.D. group homes.

INTRODUCTION

One result of a shift in attitude toward developmentally disabled (D.D.) persons over the last twenty years has been a change in the type of housing provided for these persons. Developmentally disabled persons are being moved out of institutions into smaller "group homes" within the community. Each of these residences serve up to twenty persons. Some of these homes were existing single family dwellings, some were structures which have been adapted from other uses, and others are new homes specifically built for D.D. persons.

A significant problem with developing and maintaining group homes in a community is resistance from neighbors. Often the only information available to neighbors for judging the quality of the D.D. home in their neighborhood is the home's appearance and the activities which take place in the outdoor spaces. Therefore, one area of concern to organizations responsible for providing group homes is how these homes should be designed or readapted. The design of the exterior facade and yard are particularly important for at least two reasons: 1) they provide an image of the home and its residents to neighbors and 2) they have the potential to provide an environment which is supportive to the personal growth of residents.

Background

The proliferation of group homes is primarily the result of a shift in society's attitude toward the mentally retarded. No longer are D.D. persons looked upon as a segment of society who only need to be "protected and cared for." The current attitude treats each person as an individual who is entitled to grow and develop to the maximum of his or her potential.

This philosophy was first developed in Denmark and Sweden as a reaction to the poor quality of life provided by institutional care. The philosophy is embodied in a principle called "normalization" proposed by Nirje, the executive director of the Swedish Association for Retarded Children, and Bank-Mikkelsen, the head of the Danish Mental Retardation Services (1969). It essentially means providing the mentally retarded with "patterns and conditions of everyday life which are as close as possible to the norms and patterns of mainstream society" (Nirje, p.181, 1969). Wolfensberger further expanded this idea
to include the "Utilization of means which are as culturally normative as possible" (p.28, 1973). This definition emphasizes process as well as product. The development of smaller community residences was a response to the normalization principle. The success of their actual placement within communities is a result of two factors: 1) efforts by concerned relatives and service-providing agencies and 2) establishment of laws supporting the rights of developmentally disabled persons (Ferleger and Boyd, 1980).

An example of the need for additional D.O. group homes can be demonstrated by looking at Illinois. It, like other states, has been transferring persons from large institutions into smaller "group homes" within the community. Presently Illinois has about 40 D.O. group homes. Seventy-five to three hundred additional homes would be needed to house the 1,500 persons now residing in Illinois institutions who would be appropriate candidates for such community residences. This level of demand is anticipated to continue for some time in the future. Therefore, it is imperative that information about the design of group homes be available to help those responsible for developing these homes.

Unfortunately, little empirical information exists about design to help planners and designers. Only a few research studies have been accomplished which address issues related to design (Reizenstein and McBride, 1977; Knight et al., 1978; Robinson, 1982).

The design of the exterior facade and spaces are potentially very important to organizations responsible for placing a group home in a community. As mentioned previously, these spaces present an image of the home and its residents to the neighbors and they could also provide an environment supportive to residents' needs.

Image of D.O. Homes

The perception which neighbors form about residents of a D.O. home may be due to the cues which exist in the exterior environment. The design of the home, the type of building materials, the care with which the yard is maintained, and the activities which take place in the yard are a few examples of such cues. Often, the design of the exterior space and the activities occurring in it provide the only concrete information upon which neighbors evaluate the home in their neighborhood. Therefore, the outside areas of D.O. group homes need to be given more attention than they presently command.

Other factors not related to the design of the physical environment, such as previous experience with mentally retarded persons and the preplacement efforts of the organization placing a home within the community, may also contribute to neighbors' perceptions of the group home in their neighborhood. However, it is the factors that are related to the design of the physical environment and the activities which take place in that environment which are of most value to a designer. Moreover, information which addresses design-related issues and relates these issues to perceptions by neighbors of the group home is helpful not only to designers, but also to the planning and placement of group homes.

The issue of neighbors' perceptions is especially important since a major problem of service agencies who support group homes is finding neighborhoods which will accept a D.O. home. Reluctance by neighbors may be due, in part, to the perception that D.O. people are very different from themselves. There is research which suggests that positive changes have occurred in attitudes toward retarded individuals when personal contacts have increased (Grunewald, 1969). Thus, neighbors who become acquainted with D.O. residents may be more tolerant of the presence of a group home within their neighborhood. Neighbors are also very concerned that if they allow a group home in their neighborhood, property values will decline. A review of research by Lauber (1981) does not support this belief.

Little empirical information exists about neighbors' perceptions of the group homes or their contact with D.O. residents. One study, undertaken in 1970 by Gottwald, asked neighbors about the appropriateness of various D.O. resident activities. A majority felt that the retarded should not drink (85%) or go downtown alone (58%). However, many thought D.O. persons would make good neighbors (48%). This, at least, is encouraging.

Potential for Meeting Residents' Needs

The second way in which the outdoor spaces surrounding a D.O. home may be important is by providing a supportive environment for residents. One of the most important factors for successful adjustment of D.O. persons within the community is the development of socially appropriate behavior (Birenbaum and Seiffer, 1976; Edgerton,
Gunzburg (1973) cites research by Clarke et al. (1958) which indicates that the provision of a stimulating environment has resulted in improved social skills for D.D. adults. The provision of an environment designed according to the normalization principle has not been shown to be sufficient for increasing normalized behavior. However, acquisition of improved social skills has resulted from environments which offer a resident the opportunity for independence, self-sufficiency, and control (Knight, 1978).

Research about the effect one's immediate neighborhood environment has upon development of appropriate social skills has been ignored (Gunzburg, 1973). This is unfortunate since the outdoor areas surrounding group homes have the potential to provide residents with an opportunity to grow as individuals. They could be designed as stimulating environments where the resident would be allowed independence and control. A well-designed environment could give the resident an area to call his or her "own" or could provide an opportunity for the resident to explore personal likes and dislikes. It could function as an area for chance social interaction with neighbors which would allow residents to practice their social skills. It could also be an area in which residents could learn additional skills such as gardening or yard maintenance.

Various individual aspects of group homes have been examined (Heal, 1980). While interior design has received some attention, there is a critical lack of research about issues related to the design of the outdoor physical environment.

THE STUDY

The research reported in this paper is a part of a larger study which included information from staff, residents, and neighbors. Such information is very important because of the difficulties that service organizations encounter when trying to place a group home within an established neighborhood.

Some of the specific research questions that the study explored include the following: 1) What are the perceptions which neighbors have about the D.D. home? 2) How satisfied are the neighbors with the D.D. home? 3) What is the relationship between neighbors' perceptions of the group home and their satisfaction with it? 4) Are there differences in the perceptions of the neighbors of D.D. homes that were once regular single family residences and the perceptions of neighbors of the other group homes? Hopefully, information about these issues will suggest directions for exploring design-related issues further. Since information about these issues is lacking, it seems reasonable to begin with a basic exploratory study.

Sample of Homes

Seven homes located in Illinois were selected (see Figure 1). Each of the homes was chosen primarily for its convenience and accessibility to the author.

Housing styles varied widely. The sample included representatives of the three major housing types used for D.D. group homes (see Table 1). It included two homes specially built for D.D. residents, two adapted convents, and three existing single family bi-levels. The inclusion of different housing types results in information which should be potentially more generalizable and also allows for the partitioning of data so that comparisons among types can be made. For example, the more "normal looking" single family homes could be compared to the other "less normal looking" homes.

This study is a preliminary attempt to examine some of the effects of different housing styles. While other characteristics, such as degree of retardation, level of social skills, etc., may also be important, the time and financial limita-
<table>
<thead>
<tr>
<th>Number of Residents</th>
<th>Type of Structure</th>
<th>Location</th>
<th>Surrounding Neighborhood</th>
<th>Special Exterior Features</th>
<th>Height</th>
<th>Residents Sex</th>
<th>Residents Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home 1</td>
<td>13</td>
<td>build as D.D. home</td>
<td>edge of small town</td>
<td>patio</td>
<td>1 story</td>
<td>male &amp; female</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 2</td>
<td>20</td>
<td>adapted convent</td>
<td>country</td>
<td>u-interior courtyard</td>
<td>2 story</td>
<td>male &amp; female</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 3</td>
<td>13</td>
<td>built as D.D. home</td>
<td>city 100,000 population</td>
<td>patio</td>
<td>1 story</td>
<td>male &amp; female</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 4</td>
<td>20</td>
<td>adapted convent</td>
<td>suburb of Chicago</td>
<td>u-interior courtyard</td>
<td>2 story</td>
<td>male &amp; female</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 5</td>
<td>5</td>
<td>existing single family</td>
<td>suburb of Chicago</td>
<td>patio</td>
<td>bi-level</td>
<td>female</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 6</td>
<td>3</td>
<td>existing single family</td>
<td>suburb of Chicago</td>
<td>patio</td>
<td>bi-level</td>
<td>male</td>
<td>young adult to middle age</td>
</tr>
<tr>
<td>Home 7</td>
<td>5</td>
<td>existing single family</td>
<td>suburb of Chicago</td>
<td>patio</td>
<td>bi-level</td>
<td>middle age</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Characteristics of Group Homes
tions of this study did not allow for such controls.

The two homes specifically built as group homes each housed 13 persons (see Figure 2). One of the homes was located on the edge of a small town in northern Illinois and was bordered on one edge by farm land and on the other by one acre lots. The other was located in a city of 100,000 persons and was placed in a neighborhood bordered by light industry on one side and by multi-family housing on the others.

The two adapted convents each housed 20 residents (see Figure 3). They were two-story structures built in a U shape with an exterior courtyard. Each was located on the grounds of a Catholic school complex. One was located in the middle of an older Chicago suburb, and the other in the country. The home located in the suburb looked like an island floating on a sea of asphalt.

Each of the three single family homes housed 3 to 5 residents and was located in a well established suburb of Chicago (see Figure 4). The homes were located in the less desirable locations; two faced busy streets and the other bordered on a commercial "strip" development.

Resident characteristics varied among and between homes. They were heterogeneous in terms of the residents' degree of disability and command of social skills. The type of housing did not relate to the level of the residents' retardation.

The common factor among the homes chosen was that they were residences for developmentally disabled adults and were located in a community setting. All homes were developed and operated by "not for profit" organizations.

The Instrument

A self-report survey containing 49 items was developed for neighbors. Twenty-seven of these items were adapted from ROSAPS, an instrument which was revised by Weidemann et al. (1981), and which was originally developed to gain information about residents' satisfaction (Francescato et al. 1979). This instrument is particularly appropriate because it was designed to evaluate residents' satisfaction with their housing environment. (For this study the "residents" surveyed are neighbors of the D.O. group homes.) It addresses design related issues such as the appearance of the home, evaluation of the
neighborhood, and contact with other neighborhood residents. Most items were presented in a format requiring the respondent to place a check on a five-point scale.

Some examples of the items taken from ROSAPS and adapted for the neighbors' questionnaire are: "The outside of the D.D. home looks attractive," I feel safe sitting in the front yard of my home," and "I would recommend the D.D. home to a friend who has a D.D. adult relative." A series of items also taken from ROSAPS relate to the neighborhood and asked for an evaluation of the street. Some examples of the ends of the scales for these items include "very beautiful/very ugly," "very poorly-kept/very well-kept," and "very peaceful/very noisy."

Additional items were developed by the author. Some of these related to the exterior environment, such as "There are pleasant places to sit outdoors in the front yard of the D.D. home," "Planned activities take place in the backyard," and "D.D. residents make changes to the yards of their homes (such as grow flowers, move lawn furniture, etc.)." Other items concerned contact with and perceptions about the residents of the D.D. home. These included: "The residents of the D.D. home behave in an embarrassing manner" and "D.D. residents are invited to participate in block activities."

General Procedure

A cover letter, survey, and postage-paid return envelope were hand delivered to twenty neighbors of each home. Neighbors closest to the homes were selected. The author introduced herself to the person answering the door, explained the purpose of the study, and asked for participation. The effective return rate was 37% (n=52).

Because the return rate was so low, it is quite possible that a bias exists. It may be that only those neighbors who felt strongly about having a D.D. home in their neighborhood, or those who felt positively toward it, returned their questionnaires. No follow-ups were conducted, due to fear on the part of one of the service organizations that neighbors would be antagonized. However, when conducting the survey, only two persons refused to accept a survey. One was moving, and the other gave no reason. In addition, several of the neighbors responded positively about their participation in the study. Therefore, in future studies, follow-ups should be conducted to maximize the return rate.

RESULTS

Index of Satisfaction

One measure of neighbor's perceptions of the adequacy of homes for developmentally disabled persons is whether or not one thinks it is a good place for a D.D. person to live. For this analysis, the primary and only measure of neighbors' satisfaction with the D.D. group home was an index formed by taking the average score of two highly correlated items (r=.7913, p=.001): "I would recommend the D.D. home to a friend who has a D.D. adult relative," and "If I had a D.D. relative, I think they would like to live in the D.D. home." Because of the potential difficulty involved with imagining oneself as developmentally disabled, respondents were not asked how they would like to live in the group home if they were developmentally disabled. Respondents were asked to rate each item on a 5 point scale. "Strongly agree" (or the value indicating the most positive point) was valued as 5 and "strongly disagree" (or the most negative point) was valued as 1. For those cases in which an item was not answered, only the information available was used as the index score. For example, if there was no information for the item "I would recommend the D.D. home to a friend," then only the value for the other item was used.

Level of Satisfaction

Satisfaction is an especially important criterion when considering the neighbors' perceptions of a group home. The reason it is important is the belief that neighbors who are satisfied that the home in their neighborhood is a good place for a developmentally disabled person to live will be less likely to oppose its continuing existence and will be more likely to be tolerant of its residents. It is also likely that satisfied neighbors would create a climate of social acceptance which has the potential for increased interaction between residents and neighbors. From the literature, it is apparent that such positive interaction is desirable for the social integration of the D.D. resident into the community. There are, of course, other important concepts which should be addressed in future research. However, this exploratory study concerns issues related to the satisfaction with group homes.

The index of satisfaction shows that a large majority (72%) of the neighbors
think that the group home in their neighborhood would be a good place for a D.D. person to live (see Table 2). About one-fourth of the neighbors felt neutral about this issue, and a small percentage of the neighbors were slightly negative. No one reported feeling strongly negative. The index mean for neighbors was 3.81. Neighbors generally reported that the group homes were good places for a developmentally disabled friend or relative to live (see Figure 2).

Analyses Process

One means of increasing neighbors' satisfaction with the D.D. group home in their neighborhood is to concentrate resources on the issues which contribute most to this criterion. These issues and their relative importance can be determined using a two-step multivariate process. For this process, the satisfaction index is the dependent variable and the other 47 items are the independent variables. The first step in this process is principal component analysis. This procedure groups highly correlated variables together into sets called components or factors. Once the variables are grouped into factors, another multivariate technique, multiple regression, can be used to determine which factors are significant predictors of the satisfaction index.

Principal Component Analysis

A principal component analysis was performed using the 47 individual items from the neighbors survey. This procedure yielded a 9 factor solution. Each of these factors represents a conceptual issue (see Table 3).

Multiple Regression Analysis

Multiple regression was performed using the satisfaction index as the dependent variable and the 9 factor indices as the independent variables. Two of the nine factor-based indices were determined to be statistically significant predictors of neighbors' satisfaction with group homes (p < .05, see Table 4).

<table>
<thead>
<tr>
<th>Rating</th>
<th>(n)</th>
<th>Adjusted Cumulative Frequency</th>
<th>Combined Positive &amp; Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Negative</td>
<td>0</td>
<td>0%</td>
<td>4% Negative</td>
</tr>
<tr>
<td>Negative</td>
<td>2</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>12</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>27</td>
<td>54%</td>
<td>72% Positive</td>
</tr>
<tr>
<td>Very Positive</td>
<td>9</td>
<td>18%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Frequencies for the Satisfaction Index
<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street peaceful</td>
<td>.753</td>
</tr>
<tr>
<td>D.D. Residents talk with others</td>
<td>.666</td>
</tr>
<tr>
<td>Street beautiful</td>
<td>.666</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>D.D. Residents are rude</td>
<td>.836</td>
</tr>
<tr>
<td>D.D. Residents act embarassingly</td>
<td>.794</td>
</tr>
<tr>
<td>D.D. Residents act threateningly</td>
<td>.779</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>Feel safe in back yard</td>
<td>.871</td>
</tr>
<tr>
<td>Feel safe in front yard</td>
<td>.846</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>I have invited D.D. Residents into my home</td>
<td>.786</td>
</tr>
<tr>
<td>I know the names of D.D. Residents</td>
<td>.690</td>
</tr>
<tr>
<td>D.D. Residents invited to participate</td>
<td>.580</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>D.D. home looks like an office</td>
<td>.749</td>
</tr>
<tr>
<td>D.D. home similar to others</td>
<td>.538</td>
</tr>
<tr>
<td>D.D. home compared to others</td>
<td>-.518</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>Staff plan activities in front yard</td>
<td>.873</td>
</tr>
<tr>
<td>Residents use front yard</td>
<td>.798</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>More important neighbors' yards look nice</td>
<td>.880</td>
</tr>
<tr>
<td>More important D.D. yard looks nice</td>
<td>.869</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>Front yard attractive</td>
<td>.858</td>
</tr>
<tr>
<td>Back yard attractive</td>
<td>.721</td>
</tr>
<tr>
<td>D.O.</td>
<td></td>
</tr>
<tr>
<td>Street looks new</td>
<td>-.774</td>
</tr>
</tbody>
</table>

Table 3: Principal Component Based Indices for Neighbor Data
### Contact Between D.D. Persons and Neighbors

The strongest predictor was index 4, the contact that the neighbors have with the D.D. residents. What this implies is that the extent to which the residents invite the neighbors into the home, the neighbors know the names of the D.D. residents, and the residents are invited to block activities, the more likely those neighbors are to think that the group home would be a good place for a developmentally disabled person to live.

Although one might find the amount of contact between D.D. residents and neighbors to be similar to the amount of contact between neighbors and other neighborhood residents, it is not the comparison which is important. The contact presents an opportunity for residents to practice social skills, develop friendships, and raise their level of self esteem. It presents the opportunity for neighbors of the D.D. home to learn more about the residents in a non-threatening manner. Hopefully, such interaction would result in better relations between neighbors and residents.

Contact between D.D. persons and neighbors in this sample appeared to be very low. Sixty-three percent (63%) of the neighbors reported they knew none of the names of the D.D. residents, and only 10% reported they knew all of the names of the residents. Casual neighborly contact was reported to be higher. Thirty-six percent (36%) of the neighbors and 24% of the residents reported a high level of contact (i.e., "stop and talk with each other while out of doors"). Occasional contact was reported by 33% of the neighbors and 24% of the residents, while infrequent contact was reported by 31% of the neighbors and 52% of the residents.

Invitations to participate in block activities were reported to be extended to D.D. residents "often" by 3% of the neighbors, "sometimes" by 47%, and "never" by 47%. Likewise, neighbors reported to have been invited to D.D. resident activities as follows: "often" 9%, "sometimes" 33%, and "never" 59%.

Few neighbors reported extending invitations into their homes to the D.D. residents. Of the number who responded, 4% said they extended invitations "often," 14% "sometimes," and 4% "almost never." A large majority (78%) of the neighbors reported never having invited one of the D.D. persons into their home.

### Safety

The second best predictor was the safety factor index (3). Neighbors who are more likely to feel safe sitting in their front and back yards are also more likely to be satisfied with the group home. Most neighbors did report feeling safe in both their front (92%) and back (94%) yards. From these results, the placement of a D.D. home within a neighborhood does not appear to have a significantly negative effect upon neighbors' feelings of safety within their yards.

It does make sense that neighbors would be more likely to judge a home as livable if they knew the residents. It also makes sense that a group home located in a neighborhood which was perceived as being safe would also be perceived as being a good home for a D.D. person. It is also interesting to note that the next predictor (which was significant to the .11 level) was the D.D. behavior index (2). This factor based index contains perceptions of the D.D. as not being rude,

### Table 4: Predictors of Neighbor Satisfaction with Group Homes

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Beta Weights</th>
<th>R² Change</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 4 Index: Contact between Neighbors and D.D. Residents</td>
<td>.517</td>
<td>.341</td>
<td>.003</td>
</tr>
<tr>
<td>Factor 3 Index: Safety in Yard</td>
<td>.355</td>
<td>.122</td>
<td>.032</td>
</tr>
</tbody>
</table>

Multiple R = .680, $R^2 = 46.3\%$ Number of Respondents = 52
embarrassing, or threatening. Although this predictor would generally not be considered as significant at a conservative p < .05 level, it does suggest the hypothesis that development of social skills by D.O. residents is important to development of neighbors' perceptions. Previous research has blamed the residents' lack of social skills for problems with integration of D.O. residents into the community. It is important to note that often the only information with which neighbors can judge the quality of the group home in their neighborhood is the home's appearance and the activity which takes place out of doors.

Normalized Appearance

Another interesting issue is that the factor index most closely representing a normalized appearance (5) did not appear as a significant predictor of satisfaction. Because of the emphasis placed upon adherence to the normalization principle it is important to examine what differences, if any, occur between homes which appear normal (i.e., single family residences) and those which do not (i.e., converted convents and large group homes).

The relationship between normal and non-normal appearance of homes and the supportiveness of the physical environment needs examination. Perhaps a less normalized environment which offers a variety of skill development activities, encourages social interchange, and fosters the ability of residents to develop a unique personality is the type of environment which should be designed and encouraged.

T-tests Between Normal and Non-Normal Appearing Group Homes

One important aspect of normalization that has design-related implications is the appearance of normality. In order to see if there were differences between group homes which appeared normal and those which did not, they were divided into two groups. One group was composed of three homes which were normal looking, typical single family dwellings; the other was composed of the remaining less normal appearing four homes. T-tests were performed on the 49 individual variables from the neighbors questionnaire. Some very interesting differences occurred (see Table 5). As one might expect, the single family homes were perceived as being located on a street which was more "well kept" and "homelike." They were also perceived to be more similar to the other homes on the street and to look less institutional. This confirms that neighbors do perceive the differences between a "normal" home and an institutional looking one. Residents were also perceived as being more likely to use the front yard.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1 Homes Mean</th>
<th>Group 2 Homes Mean</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street &quot;Well Kept&quot;</td>
<td>3.90</td>
<td>3.50</td>
<td>.006</td>
</tr>
<tr>
<td>Street &quot;Home Like&quot;</td>
<td>4.20</td>
<td>3.81</td>
<td>.020</td>
</tr>
<tr>
<td>Residents Use Front Yard</td>
<td>2.75</td>
<td>2.10</td>
<td>.043</td>
</tr>
<tr>
<td>Outside of D.O. Home Attractive</td>
<td>3.66</td>
<td>4.18</td>
<td>.005</td>
</tr>
<tr>
<td>Home Similar to Others</td>
<td>3.83</td>
<td>2.41</td>
<td>.000</td>
</tr>
<tr>
<td>Home Does Not look Like an Office</td>
<td>4.20</td>
<td>2.81</td>
<td>.000</td>
</tr>
<tr>
<td>Home's Appearance Compared to Others</td>
<td>2.93</td>
<td>3.41</td>
<td>.002</td>
</tr>
</tbody>
</table>

Group 1: Single Family Type Homes (Homes 5, 6, and 7)
Group 2: Other Homes (Homes 1, 2, 3, and 4)

Table 5: T-test for Neighbor Data
However, there were some other significant differences which one would not expect. The more normal appearing group homes were perceived as being less attractive than the other homes on the block. Furthermore, the more institutional homes were perceived to have a better appearance than the other homes on their street. The significance levels for the last two items were .005 or less, so they are not very likely to have happened by chance. However, when one considers the neighborhoods in which the less normalized homes are located, it may be that the neighbors perceive these homes in a relatively more positive light. That is, perhaps the normal homes are so well integrated that they are not very different from the rest of the homes on the block. Because some neighborhoods containing the non-normal homes had some rather poorly kept neighboring houses, the more institutional homes may have been perceived as more attractive as a result of their being better maintained and more unique in character.

DISCUSSION AND RECOMMENDATIONS

Discussion

The outdoor space surrounding homes is potentially important from two perspectives. The first perspective and the role it played in influencing the perceptions of neighbors is examined here. Often the only basis a neighbor has for judging the quality of a group home or its residents is the design of the outdoor space and the activities which take place in those spaces.

The second perspective is that of the residents. The outdoor areas offer an extension of living space and an area where informal social interaction with other neighborhood residents can occur. These are places where residents can practice social skills in a supportive environment. These two perspectives are not totally separate. The physical environment, activities, and people are interrelated.

Recommendations

Because of the exploratory nature of this study, it is difficult to suggest specific design recommendations, especially since only a 37% sample return was obtained. However, two general design recommendations are presented.

1. Homes should be placed in close physical proximity to neighborhood homes.

The most important conceptual issue contributing to neighbors' satisfaction was the amount of contact between residents and neighbors. Close physical proximity to neighbors allows chance socialization to occur more readily. In addition, significantly more use by residents of the D.D. front yards was reported by neighbors of the single family homes. Furthermore, a higher level of contact (as represented by the variable "residents stop and talk with others while outdoors") was reported for the single family homes (mean 3.2) as compared to the non-single family homes (mean 2.7). The group of single family homes not only "appeared" more normal than the homes in the other group, but were also in neighborhoods which were more physically dense. The homes were much closer to one another. Although some of the less normal appearing homes such as the convents were judged as appearing more attractive, "appearance" did not contribute highly to neighbors' satisfaction with the group home in their neighborhood. Therefore, the most valuable trait which the single family homes have in common may be proximity to neighbors, and not their appearance.

2. Other opportunities for chance social interaction should be included in the design of outdoor spaces. This recommendation is also based upon the importance that contact between residents and neighbors has upon neighbors' satisfaction with the D.D. home in their neighborhood. It must be stressed that in order for the design of outdoor spaces to be an effective support for the development of appropriate behavior of residents, management rules and training of residents must also be instituted which encourage the desired behavior. In this way the outdoor spaces can act as a backdrop to culturally valued behaviors and hopefully will affect neighbors' perceptions of D.D. residents in a positive manner.

Translation to the Physical Environment

Since contact with residents was the most important predictor of neighbor satisfaction, let us examine one of the non-single family homes and present a simple change in the physical environment which might improve opportunity for chance socialization to occur. The site plan of home 1 is shown in Figure 6. Note the placement of the garden. It is located at the rear of the property. Its location eliminates an opportunity to encourage chance socialization with next-door neighbors who also have a garden. Furthermore, the placement of an industrial dumpster next to the
neighbor's patio not only discourages socialization, it encourages resentment. An excellent opportunity has been missed. Removal of the dumpster is absolutely necessary. Several smaller garbage cans could be placed in the screened service area where the lawn mower is now stored. If storage space for the lawn mower is then required, a shed could be placed at the back of the lot. The garden should be moved adjacent to the neighbor's garden. Planting flower beds near the entry to the drive could also provide an opportunity for neighbor contact. Even though the home is physically separated from others due to the large lots, people tend to jog and take walks so that the periphery of the property would be the areas most likely to encourage social contact. The pragmatic suggestions mentioned above are very simple. However, with further examination of the existing homes, some "more creative" design solutions could be developed for each of the homes.

Summary

The analysis presented is part of a larger study examining perceptions of neighbors, residents, and staff of group homes for D.D. adults. It is exploratory in nature and based upon a relatively small sample. Although caution must be exercised in interpretation, it does suggest issues concerning the relationship between the design and perception of the exterior spaces. Designs which provide opportunity for contact between residents and D.D. persons should be explored further.

Footnotes

1. This research was supported by the Illinois Department of Mental Health and Developmental Disabilities.

2. This process has been used to determine predictors of resident satisfaction in multi-family housing (e.g., Weidemann et al., 1981; Butterfield et al., 1980; Francescato et al., 1979).
REFERENCES


Heal, L. and Novak, A. Residential Satisfaction Scale. An instrument which may be obtained from the authors, Department of Special Education, University of Illinois, Urbana, 1960.


JUDGED APPROPRIATENESS OF RESIDENTIAL STRUCTURES IN NATURAL AND DEVELOPED SHORELAND SETTINGS

Paul H. Gobster
Department of Landscape Architecture
University of Wisconsin-Madison

ABSTRACT

The influence that perceived changes in the landscape setting had on the judged appropriateness of shoreland development was studied through a perceptual preference technique. Student S's evaluated 66 color slides of residential shoreline development on their visual appropriateness in "wild", "natural", "recreational", and "urban" settings on seven-point semantic scales. When slides were independently scaled for levels of naturalness, contrast, and complexity, significant differences between setting types were found (p < .001). Supplementary analyses were also conducted via multiple regression analysis to determine factors which would best predict the appropriateness of structures within each of the four setting types. Contrast, complexity, naturalness, and visible development were consistently found to be the best predictors, with cumulative R² values in regression equations ranging from R² = .35 for "appropriateness in a recreational setting", to R² = .80 for "appropriateness in a natural setting". Applications of research findings to aesthetic policy and zoning standards for shoreland development are discussed.

Research and Policy

Research in environment-behavior relationships and public policy with respect to environmental resources often share a common goal- a better "fit" between people and their physical surroundings. Unfortunately, the link between research and public policy is difficult to establish insofar as concepts in the research literature cannot be couched in language acceptable to policy-makers and the public. While this linkage problem is pervasive, it is particularly evident when attempts are made to connect policies regarding the appearance of the landscape to empirical studies of landscape perception and preference.

For example, concepts such as "mystery" and "coherence" within a landscape scene have proven helpful in the prediction of preference (R. Kaplan, 1973). However, developing standards to control such abstract properties of the environment is difficult at best, and may well be deemed illegal when subjected to judicial tests (Costonis, 1981). By contrast, "perimeter area of intermediate vegetation" (Shafer, et. al., 1969) or "mean height of streambank vegetation" (Pitt, 1976) have also been studied as predictors of preference. While these properties of the environment can be readily measured and even managed, they are so concrete and circumscribed that any intuitive relevance to a pleasing landscape appearance is lost.

A similar conceptual trap applies to aesthetic policies implemented in built and natural environments. Standards and criteria for building setbacks, lot widths, and other bulk regulations are in part intended to protect landscape appearance (Buescher, et. al., 1976) but research has not demonstrated their aesthetic relevance. Other policies refer to harmonizing or unifying development with the surrounding environment, but concrete guidelines for accomplishing these objectives are rarely given.

The consequences of the illustration described above are apparent. Research of limited utility and policy without empirical support continue to evolve independently. If the link between research and policy is to be made, it must start with a conscious attempt at defining environmental variables in such a way that they are compatible with concrete and aesthetically meaningful policy statements and standards. This paper represents an effort to define research concepts in language useful for regulating the visual appropriateness of residential development in shoreland areas.

Policy and standards that regulate the visual aspects of shoreland development have been criticized on at least two accounts: 1) that a common set of standards applied uniformly over all lakes
and rivers does not take into consideration the variability of the resource setting, or of people's expectations of what types of development are appropriate, and 2) that current standards applied to shoreland development do not have the intended effect of protecting scenic beauty (Kusler, 1970). By addressing these problems empirically, it was hoped one might better understand the impact that policy standards have in protecting shoreland aesthetics.

Visual Appropriateness

Visual appropriateness is defined as the compatibility of development, relative to its perceived setting. In this research judged appropriateness of a given development was expected to change according to an observer's mental set regarding the context of that development.

Despite a lack of in-depth research, a number of papers dealing with the concept have appeared in the literature. Surrogate terms for appropriateness have included: compatibility (P.F. Anderson, 1979; Hendrix and Fabos, 1975; Nassauer, 1979; Zube, Pitt, and Anderson, 1974; and others), harmony (U.S. BLM, 1980), unity and intactness (Jones and Jones, 1975), congruity (Wohlwill, 1979), appropriateness (Wohlwill, 1982), and others. The most promising inquiries have been made by Wohlwill and his colleagues on the appropriateness of structures in natural environments (Wohlwill, 1973, 1977, 1979; Wohlwill and Heft, 1977; Wohlwill and Harris, 1980). In these studies, contrast, naturalness, complexity, and other variables were found to relate strongly to visual appropriateness.

The concept of appropriateness has been used for many years in zoning regulations. While the original intent of land use controls was to separate incompatible land uses for the assumed reasons of protecting the health, safety, or morals of the community (see, for example, R.M. Anderson, 1960; O'Neill, 1967; Smardon, 1978), many zoning standards today are clearly aimed towards the goal of achieving visual compatibility as well. Standards governing lot size, setbacks, and the heights and colors of buildings and signs have aesthetic connotations, and have been used in past zoning ordinances.

The Nature of the Setting

In this study, landscape setting was defined as the implied context in which a land use is viewed, and is assumed to be dependent on the physical elements present in a scene and the mental meaning of that context. The nature of the setting forms a necessary component in past conceptualizations of appropriateness: "The sense of sheer perceptual blending in or clashing between the appearance of man-made elements and their visual contexts" (Fittingness, Wohlwill, 1980) ... "The relationships between adjacent land uses" (Land Use Compatibility, Hendrix and Fabos, 1975) ... and "Similarity in naturalness of spatially adjacent land uses" (Compatibility, Nassauer, 1979) (emphasis supplied).

The nature of the setting, like visual appropriateness, has received little attention in the literature. Only in research by Wohlwill (1979) has the effect of differences between setting types been studied in relation to judged visual appropriateness. In using models to portray land uses in natural and developed settings, significant differences in ratings of appropriateness due to changes in the setting were found for one of two structure types considered.

In this present research, it was hypothesized that there would be significant differences in the judged appropriateness of shoreland structures as a function of different setting types, implied through verbal descriptions given to subjects.

The reason for choosing this hypothesis for research was based on the work of Wohlwill (1979) just mentioned, as well as on previous conceptualizations of environmental variability in the management of public recreational lands. For instance, in the Forest Service "Recreation Opportunity Spectrum" (USFS, 1981) system, public recreation areas are managed according to the existing state of the environment and the type of recreational experience to be provided for the user. Management standards and policies vary along a continuum from "primitive" to "urban". The same type of differentiation is made in Wild and Scenic Rivers classification (HCRS 1979). The nature of the setting is also taken into account in zoning regulations for private land, but usually only on specially designated resources. For example, in Wisconsin one uniform set of minimum zoning standards is applied...
across all shorelands in the State. An exception to the norm are two designated "wild and scenic" rivers, where additional restrictions on lot size, building setback, vegetative cutting, structure height, and color have been enacted (Wis. Admin. Code Chap. NR118, 1978; Florence Co., Wis., 1977). In contrast, other states such as Minnesota have implemented variable standards for development by classifying all lakes and rivers into "natural", "recreational", or "general development" categories (Minn. DNR, 1971). Empirical support for this research hypothesis would be consistent with the notion of different zoning standards for controlling shoreland residential development, dependent on the setting.

In this research four different setting types were considered: "wild", "natural", "recreational", and "urban". These descriptors were chosen to imply to observers the degrees in naturalness and levels of development associated with lake and river types.

Predictors of Judged Appropriateness

The choice of concepts used as predictors of appropriateness was based on their past importance in landscape preference research, and on use as zoning standards for shoreline development. These factors included structure setback, the vegetation screening of structures, structure size, naturalness of the shoreland strip, man-made complexity, the color contrast of structures, amount of visible development, and the distance of structures in the scene. An attempt was made to clearly define concepts both conceptually and operationally so that translation into policy criteria would be possible. In this research it was hypothesized that those variables that synthesized properties of the entire scene (naturalness, complexity, and contrast) would be better predictors of appropriateness than those which described only specific aspects of the scene (setback, vegetation screening, distance, size). Support for this hypothesis was based on observations by Zube, Sell, and Taylor (1982:33-34), Appleton (1975:21), Wohlwill (1973:172), and Litton (1972) that perceptions of landscape quality might be better defined in terms of relationships or interactions between landscape elements rather than in the specific elements themselves. Naturalness, complexity, and contrast can be thought of as higher order abstractions which might not only have greater aesthetic meaningfulness than individual scene elements, but might also be more "universal" properties, common across a variety of landscape types.

METHODS

Stimulus Selection

The stimulus set used in this study consisted of slides of typical second home residential homes or "cottages", taken from a number of lakes and rivers throughout the State of Wisconsin.

Scenes were sampled in a purposive manner, using 35mm. color slide film. Restrictions were placed on the sampling process to hold certain environmental, development, photographic, and ephemeral variables constant across scenes, while allowing those variables under study to vary across a range representative of actual conditions found within Wisconsin shoreline development types. Out of 200 scenes, a final sample of 66 slides was selected for use as the stimulus set.

Subjects

Because of the size of the slide sample, a one hour time limitation on the use of subjects, and the number of rating scales required, it was necessary to partition the slides into two sets for presentation to different subject groups. Two groups of introductory landscape architecture students (N = 22, 25) were used for the evaluations. Seven duplicate slides were included both within and between groups to access intrarater reliability and intergroup rating consistency.

Procedure

The experimenter introduced the study to observers by explaining the concepts of visual appropriateness and setting type as they pertained to shoreline development, and illustrated how one's notion of structure appropriateness might be influenced by perceived changes in the setting. A one-page handout was given to observers describing "wild", "natural", "recreational", and "urban" setting types in terms of degree of naturalness and levels of development. To further illustrate setting types without showing specific types of development, wide angle and low oblique
aerial photographs were shown to observers for each setting type. Ten non-rated anchor slides were also shown to illustrate the type and range of scenes observers would be rating.

Each slide was rated on four seven-point semantic-differential type scales (highly inappropriate - highly appropriate), one for each of the four setting types. Because a given scene was evaluated on all four scales at one time, the order in which the scales appeared was counterbalanced between subjects to randomize bias which could have been introduced by scale order. Twenty-five seconds were alloted to evaluate each slide on the four rating scales.

Predictors- Scaling of Scenes

Each slide was scaled on eleven independently derived measures hypothesized to have an influence on perceived appropriateness in wild, natural, recreational, and urban settings. Percent of scene measures for the amount of sky, water, vegetation, visible development, and vegetation screening of a structure were derived though a grid-based technique (Shafer, et. al., 1969). Size of structure and distance to structure were assessed through a mathematical proportions technique. The variables naturalness, contrast, complexity, and setback were evaluated by a panel of ten trained judges on five-point scales.

Design

Three separate 4x5 factorial designs with repeated measures on appropriateness judgements were used to test the hypothesis the perceived changes in the setting would influence evaluations of appropriateness. Naturalness, complexity, and contrast were used as grouping factors having five treatment levels (low to high). Setting type was the trial factor in which repeated measures were taken on each of the four appropriateness judgements.

To address the hypothesis concerning the relative abilities of the independent variables to predict the appropriateness of structures in each of the four setting types, stepwise multiple regression analyses were performed. Because some of the independent variables used in this study were highly intercorrelated (r > .70) with one another, those variables which had the highest correlation with the criterion were included in the regression equation and the intercorrelated ones were dropped.

RESULTS

Analyses of variance on mean appropriateness scores for all three tests showed that the trial factor appropriateness setting type, grouping factors contrast, complexity, and naturalness, and the interaction were all significant sources of variance. In all cases, variance between trial factor, grouping factors, and interaction were significant beyond the p = .001 level. Low levels of contrast and complexity and high levels of naturalness were associated with high levels of appropriateness of structures in wild and natural settings. In recreational and urban settings however, reverse relationships were found. Higher levels of complexity and contrast and lower levels of naturalness were found to be more appropriate in these settings. The relationships between judged appropriateness and setting type as a function of level of naturalness, complexity, and contrast are shown in figure 1.

Multiple stepwise regression analyses were used to determine the abilities of the independent variables in predicting the appropriateness of structures in wild, natural, recreational, and urban settings. Naturalness, complexity, contrast, and visible development were as hypothesized found to consistently be the best predictors of appropriateness in all four cases. Vegetation screening and setback were also found to significantly contribute towards explaining variance within the criterion variables, but to lesser extents. Four and five term regression equations yielded the following cumulative R² values for each appropriateness variable: wild setting, R² = .71; natural setting, R² = .80; recreational setting, R² = .35; and urban setting, R² = .68.

Reliability

Reliability tests for the dependent measures included inter- and intrarater reliability and intergroup rating consistency. The following Pearson correlation coefficients indicated the degree of agreement between observers, averaged both within and between groups: appropriateness in a wild setting, r = .57; appropriateness in a natural
setting, $r = .44$; appropriateness in a recreational setting, $r = .16$; and appropriateness in an urban setting, $r = .30$. Intrarater reliabilities were $r = .57$ for appropriateness in a wild setting, $r = .50$ for appropriateness in a natural setting, $r = .43$ for appropriateness in a recreational setting, and $r = .62$ for appropriateness in an urban setting. Nine slides common to both slide sets were used to test for group differences in ratings for each of the four response scales. No significant differences were found (α = .05) in any of the 36 t-tests performed. In other words, it appeared that group judgements were consistent with one another.

Paired comparison t-tests were conducted on the mean score differences of ten randomly selected and independently assessed percent of scene and proportionally measured variables. No significant differences were found for any of the seven variables.

Interrater reliability tests for trained subjects (N = 10) produced the following coefficients: naturalness, $r = .70$, complexity, $r = .76$, contrast, $r = .46$, and setback, $r = .50$. Between subject correlations for contrast and setback were substantially lowered due to very low and even negative correlations between one judge's ratings with the rest.

**DISCUSSION**

Results from the analyses of variance strongly supported the hypothesis that there would be differences in appropriateness ratings due to perceived changes in the setting. The wild setting could be thought of as the most "restrictive", where high degrees of naturalness and low degrees of complexity and contrast
were perceived as relatively appropriate. The same general relationship was true for natural settings, although for equal ratings of appropriateness, contrast and complexity were one to two points higher and naturalness one to two points lower (on a 5-point scale). For ratings of appropriateness in recreational and urban settings, this relationship was reversed, although the slopes of the functions were not quite as dramatic as they were in wild and natural settings. The recreational setting could be thought of as the more restrictive of these two, where increases in complexity and contrast and decreases in naturalness received higher ratings of appropriateness than for urban settings. An interesting point to note here is that mean appropriateness ratings for structures in urban areas seldom reached 3.5 on a 7-point scale, while in recreational settings they never went below 3. This might be seen as a perceived "anything goes" attitude towards development in recreational settings.

These findings could be of value to resource managers in terms of guiding new development on lake and river shorelines. Results are consistent with the notion that people do discriminate between the appropriateness of development dependent on the nature of the setting, and thus help support the use of different policies and standards for different levels and types of development.

Regression analyses results supported the hypothesis that the "higher order" variables naturalness, complexity, and contrast were important predictors of appropriateness in all setting types. These results also showed that the more traditionally used zoning concepts such as setback and vegetative screening were of less importance. Of all variables used in predictive equations, it was clear that those that measured the overall aspects of scenes were the most relevant. In terms of shoreland management, these might be the critical ones to control for improving the visual compatibility of structures. In other words, although a house might be heavily screened from the water and well set back from the shoreline, other visible elements can still detract from visual quality.

In shoreland ordinances and guidelines this point should be emphasized— in wild and natural settings landowners should be encouraged to make all development less obtrusive. Boat houses and large piers should be discouraged, and such things as television antennas, storage sheds, and vehicles should be screened, insofar as they influence the naturalness, complexity, contrast, and visibility of development in a scene.

Results from regressions also showed that present zoning restrictions might in some cases be sufficient in scope for regulating shoreline development in recreational and urban settings. People may be more tolerant of development because their expectations for a natural environment are not as high in these areas, and might be willing to accept less natural surroundings in exchange for greater shoreline utilization.

Conclusions

Results from this study have shown that naturalness, complexity, and contrast were important predictors of structure appropriateness. While these concepts are abstractions of tangible landscape elements, they are not so vague as to preclude the identification of factors which contribute to them (see footnote 1 for a characterization of structures appropriate in wild/natural and recreational/urban settings). In terms of policy and standards for protecting landscape aesthetics, perhaps these types of concepts are the most appropriate ones to manage for— they are not so concrete as to be trivial or meaningless in an aesthetic sense, nor are they so abstract to prevent their reliable assessment. While rating agreement between judges in this study did not always meet acceptable standards suggested in psychometric research (Feimer, et al., 1979), with further research more highly reliable and standardized assessment procedures could be developed for use in the management of development.

FOOTNOTES

(1) Structure Characterizations

Wild and natural settings

Structures thought of as appropriate in natural environments are obtrusive for the most part; the natural qualities of the shoreline are retained because little manipulation or alteration of the shoreline strip has occurred. Structures
in these settings are well screened and
not very visible from the water; those
portions that are visible are painted
in earth tones or are of natural-color
construction materials that blend in
with the surrounding vegetation. Home
sites are usually free from additional
clutter of man-made elements such as
boat houses, piers, and television anten­
as which would detract from the natural­ness of the scene. In other words,
these sites are low in man-made complex­
ity. In addition, houses are well set
back from the shoreline, although set­
back is not as important as these other
parameters.

Recreational and urban settings

Structures are considerably more in­
fluenced by the presence of cultural
activities than in wild and natural
settings. Much of the shoreline veget­
atation has been cut away to afford the
use of a yard and a view of the water.
Piers, boathouses and shore retaining
walls are present at the shore-water in­
terface. In addition houses are often
painted white or in other contrasting
colors, and much of the structure is
easily seen from the water.

REFERENCES

Appleton, J. 1965. Landscape Evalua­
tion, the Theoretical Vacuum.
Transactions, Institute of British
Geographers 66:120-123.

Controls. Syracuse Law Review
12:26-49.

Buescher, J.H. Wright, R.R., and
Gitelman, M. 1976. Cases and
Materials on Land Use. Second
Paul, Minnesota.

Costonis, J.J. 1981. Law and Aesthet­
ics: A Critique and a Reformulation
of the Dilemma. Michigan Law Review
80:355-461.

Feimer, N., Craik, K., Sheppard, S. and
Smardon, R. 1979. Appraising the
Reliability of Visual Impact Assess­
ment Methods. pp. 286-295 IN Elsner,
Gary H. and Richard C.
Smardon, Technical Coordinators.
Proceedings of Our National Land­
scape: A Conference on Applied
Techniques for Analysis and Manage­
ment of the Visual Resource (In­
cline Village, Nev., April 23-25,
Illus. Pacific Southwest Forest and
Range Experiment Station, U.S.
Department of Agriculture, Berkeley,
Calif.

Florence County, Wisconsin. 1977.
Zoning Ordinance for Wild River
Zones. Section 7A.

Visual Land Use Compatibility as a
Significant Contributor to Visual
Resource Quality. International
Journal of Environmental Studies.

Heritage Conservation and Recreation
Service. 1979. The Lower Wisconsin
River: A Wild Scenic River Study.
HCRI, Washington, D.C.

Jones, G. and Jones, I. 1975. Environ­
mental, Ecological, and Aesthetic
Resources of the Upper Susitna River,
Alaska. Report to the U.S. Army
Corps of Engineers. Jones and Jones,
Seattle, Wash. Final Report, DOD-ACE,
Alaska District Contract No. DACW85-
74-C-0057.

Kaplan, R. 1973. Predictors of Environ­
mental Preference: Designers and
"Clients". pp. 265-274, IN Preiser,
W.F.E., ed. Environmental Design
Research. Stroudsburg, Penn.: Dowden,
Hutchinson, and Ross, Co., Inc.

Resource Protection: Uses and
Limitations. PhD Dissertation,
University of Wisconsin-Madison.
722 p.

Litton, R.B., Jr. 1972. Aesthetic
Dimensions in the Landscape. IN
Krutilla, J.V., ed. Natural Environ­
ments. John Hopkins Press,
Baltimore, MD.

Nassauer, J.I. 1979. Managing for
Naturalness in Wildland and Agricul­
tural Landscapes. pp. 447-453, IN
Elsner, Gary H. and Richard C.
Smardon, Technical Coordinators.
Proceedings of Our National Land­
scape: A Conference on Applied
Techniques for Analysis and Manage­
ment of the Visual Resource (In­
cline Village, Nev., April 23-25,
Illus. Pacific Southwest Forest and
Range Experiment Station, U.S.
Department of Agriculture, Berkeley,
Calif.


Wisconsin Administrative Code, Natural Resources. 1979. Chapter NR118 "Standards and Criteria for the Lower St. Croix National Scenic Riverway". Dept. Natural Resources, Madison, WI.


ATTRIBUTES OF URBAN ENVIRONMENTS FEARED BY HANDGUN CARRIERS

James R. Hassinger

Department of Urban Studies
University of Alabama in Birmingham

ABSTRACT

This research focuses on handgun permit holders and urban public environments which they regard as unsafe. On the premise that carrying a handgun on one's person is a behavioral indicator of concern for one's personal safety, a random sample of registered permit holders in an urban county was used to elicit characteristics of specific areas feared.

Virtually all respondents reported "protection" as the main reason they had a handgun. They were predominately middle-class with higher than average income and education levels. Chronologic data suggested that an over-representation of males would soon be balanced by increasing numbers of female gun permit holders.

Respondents were asked how frequently they had occasion to be out in an area which they considered unsafe, and to identify the main specific area that came to mind when they considered that question. Most areas cited were in or near the downtown commercial core and adjacent older neighborhoods. Fear of downtown locales was more pronounced among females. The respondents reported being in the areas primarily for reasons of work, shopping, entertainment, or just traveling through to another destination. Most respondents thought of their own neighborhoods as basically safe, and obtained the permit to legally carry a gun when away from their homes.

Considering which specific attributes were most important in causing them to think of the area as unsafe, they most frequently cited non-physical items. Most often cited were: "juveniles loitering," "race" differences, "not enough police or guards," "news reports of specific crimes," and "common knowledge that the area is bad."

Implications for further research on fear of crime and urban public spaces are discussed.

INTRODUCTION

National survey data indicate that a large number of people now own handguns. Although many reasons exist for owning a handgun, one national survey cites the single most frequently mentioned reason as protection (Cambridge Reports Inc., 1978). Handgun ownership is more prevalent in the South than elsewhere in the United States, but while efforts to limit the proliferation of personal weapons grow so does the number of people in possession of them (Wright and Marston, 1975; Research and Forecasts Inc., 1980).

Handguns, in contrast to hunting rifles, have the quality of being small enough to be carried concealed on the person. Those people who acquire legal carry permits express the intent of having the guns on their person when away from their homes.

Fear of crime in public areas such as shopping locales, civic arenas, and other public facilities is particularly significant for urban designers and administrators because these are locations where individuals have least personal control over their safety and where public officials have the greater responsibility to maintain a safe environment. A rise in the number of people who feel a need to carry such lethal personal protection should be of real concern to those who have been charged with attending to the public safety, health, and general welfare.

Research in this area is extremely limited however. Recent aggregate data exist primarily on the national demographic characteristics of weapons owners in general, but little detailed information is available on the specific urban environments feared by protective handgun owners. National demographic studies concentrated on explaining gun ownership per se, but have not been designed to investigate specific cases where people feel a need to carry such personal protection as a handgun. Most studies have correlated fear of crime in one's own neighborhood to a variety of measures. However, fear of crime in one's own
neighborhood may be relatively low, at the same time that fear of crime in an area where one must travel is significantly stronger. Thus, a correlation of neighborhood fear with handgun ownership would inappropriately yield no relationship where one possibly exists. Fear of crime around one's own home is certainly of critical importance, but this should not minimize our appreciation for the impact of fear of crime in other areas as well. For example, fear of crime in commercial centers could have disastrous consequences for their relative viability as public investments.

Because previous research has focused more on demographics of household gun ownership, more is known about the general characteristics of gun owning households ("Does anyone in your house own a gun?") than about environments where gun owners believe a gun is needed outside the home. This study was intended to provide some initial linkage between people fearful enough to carry pistols and urban environments beyond the home by focusing more specifically on attributes of areas which gun permit holders experience as unsafe.

METHOD

This study used a mailed survey to a random sample of permit holders registered in the Sheriff's office of a large urban county in Alabama (Jefferson County) which contains a population of approximately 671,000. Birmingham, the central city of the Standard Metropolitan Statistical Area, is contained within the county and has a population of approximately 284,000. Nearly ten percent of the adult population of Jefferson County have a legal permit to carry a handgun. The Sheriff's office processes about 40 applications per day. Legal permit holders only were used in this initial study in order to exclude illegitimate owners, and to focus more acutely on those people seemingly most affected. The sample was not intended to represent the population at large but rather only the permit holders who, by their behavior, have evidenced concern for their safety outside the home. (1)

In the Spring of 1982 the questionnaire was mailed to the address of the permit holder, requesting that the "resident" fill out the survey about crime in the county. A qualifying question in the survey determined whether the respondent was actually the handgun permit owner. This method was used to preserve the appearance of anonymity for the respondent. Detailed questions were included in this survey about gun ownership, times when the respondent worked, where the respondent worked, where the respondent got the gun, and other sensitive questions in a rather long questionnaire that made a phone or door-to-door survey either impracticable or potentially highly reactive.

Nineteen hundred surveys were mailed. Of approximately four hundred returned, two hundred seventy-eight qualified for analysis. Responses from those who did not carry a gun (usually spouses) were not analyzed in this study; the present purpose was to focus on information directly from those who actually carried a gun outside the home. Responses were statistically weighted on race and sex to match these proportions of permit holders registered with the County office.

SAMPLE CHARACTERISTICS

For this study, demographic characteristics of the sample are provided mainly for background information. Variance statistics for census data were not available, thus statistical tests of differences between the permit holders and the County population at large do not appear. However, the data are generally consistent with prior demographic studies showing predominance of ownership among upper middle-class residents. The present study was intended to survey more directly on reasons for carrying guns in specific locales; thus the focus on handgun owners, per se, rather than comparisons between owners and non-owners.

Fifty-nine percent of the sample were male. The 1980 Census showed the Jefferson County population as forty-seven percent male, suggesting an over-representation of males among the permit holders by twelve points. It was also of interest that the number of women obtaining permits appears to be increasing over time. A crosstabulation of sex by time cohorts showed a significant reversal in the past five years with females now outnumbering men in applications with fifty-eight percent (Chi-square = 28; d.f. = 4; P < .05). More females are now obtaining pistol permits than in previous years.

The sample had a mean age of forty-four years, which is close to the mean age (forty-six years) of the permit eligible population in the County. Seventy-three
percent of the permit holders were of the white race; the Census showed the County population as sixty-six percent white.

Homeowners were well-represented among the permit holders with eighty-five percent reporting that they owned their residence. Seventy-three percent of the occupied residences in Jefferson County were owner-occupied at the time of the last Census.

Nearly three quarters (74%) of the sample were married. Approximately fifty-six percent of the Jefferson County population at large is married. Median household size was 2.4 persons for the sample; it was 2.71 for the County as a whole. Median household income was approximately $21,000 per year for the sample. This compared to $15,667 per year for the County as a whole as of 1979.

A high proportion of the sample, thirty percent reported at least four years of college education. Another twenty-four percent reported some college education.

Forty-two per cent of the handgun permit holders reported Baptist religious affiliation; and another forty percent reported other Protestant affiliations. While exact church membership numbers are more difficult to verify than Census statistics, of eight hundred forty-one churches listed in the Greater Birmingham Telephone Directory, forty-eight percent are listed with Baptist affiliation.

RESULTS

Reasons for Keeping and Carrying a Pistol

Ninety-four percent of the permit holders reported "protection" as the main reason for which they kept a pistol. The remaining reasons were hunting, target shooting, and collecting, but protection was clearly the main concern. The survey further explored why the permit holders carried protection by a follow-up question which asked respondents to check one of seven categories, including "other," which best described the "main reason why you occasionally carry a pistol for protection." See Table 1.

Recent popular literature has emphasized handgun ownership primarily as a result of fear but also occasionally as a simple rational response to dangerous situations. Such is the personal report, "We lost more than eleven thousand dollars of what we owned, but we weren't killed. We adapted. Now guns are a normal part of our lives, like a washing machine or a refrigerator" (Elliot, 1981). The first item in Table 1 was intended to approximate a rational response to unsafe environments, and allow an alternative to the respondent to admitting "worry." Forty-seven percent of the respondents chose this answer. The remaining items were intended to tap more directly "worry;" altruistic intentions; requests from others; and chauvinistic responses.

Thirty-three percent of the respondents directly indicated worry about victimization. Crosstabulation of sex by this question showed thirty-one percent of the males checking "worry," and forty percent of the females (Chi-square = 8.8; d.f. = 5; p < .05). Similarly, differences obtained in the other categories. Fifty-five percent of the males and forty-three percent of the females had checked "prudent." One percent of the males responded that someone else had asked them to carry it, while nine percent of the females so responded. Eight percent of the males and six percent of the females said that they carried the pistol to protect someone else. Five percent of the males and two percent of the females responded that the gun showed clearly they could not be pushed around.

<table>
<thead>
<tr>
<th>Reason</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I understand the police cannot be everywhere; the pistol is a prudent precaution</td>
<td>47</td>
</tr>
<tr>
<td>2. I am worried about being a victim of crime.</td>
<td>33</td>
</tr>
<tr>
<td>3. I carry it to protect someone I care about.</td>
<td>8</td>
</tr>
<tr>
<td>4. Someone close to me asked me to carry it.</td>
<td>5</td>
</tr>
<tr>
<td>5. Other.</td>
<td>4</td>
</tr>
<tr>
<td>6. A gun shows clearly that I am somebody who cannot be pushed around.</td>
<td>3</td>
</tr>
</tbody>
</table>
When asked what was the usual main reason for being in the unsafe area, twenty-five percent of the respondents answered "work," sixteen percent answered "shopping," thirty-seven percent said they were "traveling through" to another destination, fourteen percent cited sporting events or other entertainment; only eight percent said that they lived in the area. The majority of respondents, eighty-seven percent, identified their own neighborhood as "safe" or "very safe."

Regardless whether the respondents indicated they were simply being prudent in their behavior, or they directly admitted fear, it was clear that the group as a whole qualified as being concerned about personal safety away from home. They did not obtain handgun permits primarily to go hunting or target shooting. It was just such a group that the investigator wanted to address attributes of public environments which they considered unsafe.

Attributes of Feared Environments

Respondents were asked to, "name or locate by streets the main unsafe area that comes to mind" when they considered, "how often do you have occasion to be out in an area which you consider to be generally unsafe?" The respondents named 101 specific locales within the County. However, many of these areas fell within readily identifiable sectors of the central city - Birmingham.

Thirty-five percent of the sample said downtown Birmingham was the main unsafe area that came to mind. When including areas immediately adjacent to the downtown on the North and West sides, sixty-eight percent of the sample is included. The areas immediately North and West of the downtown have older commercial centers of their own, similar in age to the downtown but smaller in scale. The less-frequently mentioned Southside has been undergoing renewal recently with large-scale expansion of the University of Alabama in Birmingham, along with associated residential and commercial revitalization encouraged by the city.

Crosstabulation of sex by fear of the downtown in daytime hours showed a significant difference between men and women. Whereas only thirty-eight percent of the men believed the downtown to be dangerous in the daytime, fifty-eight percent of the women did (Chi-square = 9.4; d.f. = 1; P < .05).

It is of interest also that one major street in the center of the downtown which has been renovated recently through a "greening" park-like design is quite infrequently mentioned as an unsafe location (less than one percent of the sample) while most of those around it have higher frequencies. Whether this is best attributable to higher traffic, different demographics, the new design, or some other factor will have to await more detailed analysis.

Respondents were provided with a list of sixteen potential attributes of feared areas, including an other category. They were asked to check all items which applied to the main unsafe area, and which caused them to think of that area as unsafe. Table 2 lists the attributes in order of the percentage of respondents who checked the item.

The attributes included both physical and social elements, as well as informational items such as news reports. The most frequently checked item was "many hiding places for criminals." Next came the statements that "It is common knowledge that area is bad," and "too many people not of my race." The three most frequently checked items thus contained a mix of physical ("hiding places"), and social attributes ("common knowledge," and "race"). Inadequate lighting and fencing (frequently emphasized physical elements to fight crime) were relatively low in elements cited as factors in the feared areas.

The respondents were requested to choose one item as the "most important" in causing them to think of that area as unsafe. The most frequently mentioned items in this case were all non-physical items. Fourteen percent each checked, "Too many people not of my race;" "Juveniles loitering;" and "Not enough police or guards." Another nine percent checked that they or someone they knew personally had a bad experience at the location, as the most important attribute. Eight percent checked, "Have seen news reports of specific crimes there."

When asked their main source of information leading to their concerns about crime, without reference to a specific location, they most frequently cited prior victimization of themselves, a family member, or someone they knew. See Table 3. This was followed by news reports, and common knowledge. Eighteen percent of the sample listed generally unsafe social conditions
### Table 2
Attributes Cited as Present in Areas Believed Unsafe

<table>
<thead>
<tr>
<th>Attribute</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Many hiding places for criminals.</td>
<td>64</td>
</tr>
<tr>
<td>2. It is common knowledge the area is bad.</td>
<td>60</td>
</tr>
<tr>
<td>3. Too many people not of my race.</td>
<td>53</td>
</tr>
<tr>
<td>4. Have seen news reports of specific crimes there.</td>
<td>52</td>
</tr>
<tr>
<td>5. Not enough police or guards.</td>
<td>51</td>
</tr>
<tr>
<td>6. Juveniles loitering.</td>
<td>49</td>
</tr>
<tr>
<td>7. Area is physically run-down.</td>
<td>46</td>
</tr>
<tr>
<td>8. Somebody I know personally had a bad experience there.</td>
<td>41</td>
</tr>
<tr>
<td>9. Not enough lighting.</td>
<td>40</td>
</tr>
<tr>
<td>10. Few people around.</td>
<td>35</td>
</tr>
<tr>
<td>11. Derelicts or panhandlers present.</td>
<td>30</td>
</tr>
<tr>
<td>12. Parking is too far from destination.</td>
<td>22</td>
</tr>
<tr>
<td>13. I personally had a bad experience there.</td>
<td>19</td>
</tr>
<tr>
<td>14. Physical security (fences etc.) not adequate.</td>
<td>17</td>
</tr>
<tr>
<td>15. Parking lots too big.</td>
<td>16</td>
</tr>
<tr>
<td>16. Other.</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 3
Main Source of Information Leading to Crime Concern

<table>
<thead>
<tr>
<th>Reason</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Actual prior incident(s).</td>
<td>24</td>
</tr>
<tr>
<td>2. News reports about crime.</td>
<td>23</td>
</tr>
<tr>
<td>3. Common knowledge (word of mouth) about crime.</td>
<td>21</td>
</tr>
<tr>
<td>4. General unsafe social conditions (example: unsavory people) where you carry a pistol.</td>
<td>18</td>
</tr>
<tr>
<td>5. General unsafe physical conditions (example: poor lighting) where you carry a pistol.</td>
<td>8</td>
</tr>
<tr>
<td>6. Television programs containing stories about crime.</td>
<td>4</td>
</tr>
<tr>
<td>7. Other</td>
<td>2</td>
</tr>
</tbody>
</table>
as their main precedent to concern, and eight percent listed unsafe physical conditions. Considering the above information about specific locational attributes, it appears that while physical elements (e.g., hiding places) are ubiquitous in the feared locations, the respondents consider victimization itself, and news reports about victimization, or hearsay common knowledge about victimization to be important factors in the formation of their impressions. Females were more frequently among those citing prior victimization as their main source of information (55%) than were males (46%) (Chi square = 13.4; d.f. = 5; p < .05).

Actual crime rates in very specific locales of interest are difficult to obtain because boundaries provided by respondents are not often the same that are used for administrative and planning purposes in police departments. This is a more acute problem as the areas become smaller. However, statistics released by the Birmingham police on major shopping locations in the city indicate a much higher number of crimes committed in the downtown area in comparison with more externally located shopping malls. For example, statistics for 1980 reported in the Birmingham News show 438 crimes against persons in the general downtown area as compared with a total of 44 crimes from three other major mall areas at the periphery. At that time, the downtown had roughly equal numbers of shoppers as the malls, yielding a higher likelihood of victimization in the downtown (Birmingham News, August 10, 1981).

It can certainly be argued that the objective data on reported crimes show a relatively low likelihood of victimization in any event--there were hundreds of thousands of shoppers--but the relative differences may be of more importance to the shoppers than the absolute numbers. Malls appear to enjoy a very positive image relative to other locations in the county. A recent newspaper article featured one mall, "Eastwood," as "The place to meet, jog, walk, socialize," especially for elderly citizens. It is noted that a local medical center refers people to this mall as a place for regular walking programs, and a director of the local Senior Citizens Activities office says, "The elderly walk the mall instead of their neighborhood streets because it's safer" (Birmingham Post-Herald, November 12, 1983).
place, aside from changes in the crime rate, may expose proportionately more women to unsafe conditions than previously. Increases in the number of office and service sector employees have occurred in central cities where the crime rate has been increasing (Solomon, 1981). As more women have entered the work force, there are more potential female victims who feel they need protection in the event of an attack. Vandalisms or burglaries, though perhaps more common where many people live, are less newsworthy than a series of unsolved attacks on young women near a workplace or shopping area which many more people frequent. Further, because of their recent growth as an impacted group, they may feel the problem more acutely. This would be especially true of employees; shoppers could go elsewhere.

It is possible that physical changes, such as better lighting, can reduce crime by affecting the criminal's perception of the area, but it is also possible that word about decreased crime takes a long time to filter to those who have developed an impression about an area already. Non-events are not news and would likely be of less interest to most parties involved in information dissemination. This suggests two different processes. Whereas criminal actions may be more amenable to immediate consequences in the environment, attitudes of the fearful about areas may have formed over a long period of time as a result of both experience and information. The fearful attitudes (including those associated with race) may be less susceptible to immediate circumstances than are criminal acts.

It is thus possible that areas undergoing revitalization and reduced crime may benefit from a great deal of positive publicity, or it is likewise possible that a reduction of the crime rate, if unaccompanied by news of the decline, may have no effect on fear of crime. At the smaller local levels it may depend on how many people are in the informational network (hearsay), which may depend itself on how well integrated the area is socially.

The current study should be regarded as an attempt to emphasize a course of inquiry rather than a set of answers. It is hoped the course will lead to more intensive research specific to the public responsibility to provide environments that not only are believed to be safe by objective professional standards, but are experienced as safe by the average citizen as well.

Evidently, this should involve more attention to both the physical and social attributes of environments away from home, as well as those more proximate.

FOOTNOTES
1. Author wishes to note the assistance of Deborah Robbins and Daniel Strunk; and the cooperation of the Jefferson County Sheriff Department (Mel Bailey, Sheriff), and the Birmingham Police Department (Arthur Deutch, Chief). Funding by U.A.B. Graduate Faculty Research Grant.

REFERENCES


EMPLOYEE SATISFACTION WITH
THE OFFICE ENVIRONMENT:
EVALUATION OF A CAUSAL MODEL

Glenn S. Ferguson
Program in Man-Environment Relations
The Pennsylvania State University

ABSTRACT

A causal model of employee responses to the degree of openness of the office setting is developed and evaluated. This model encompasses physical, organizational, and individual variables including job level, openness of the office, auditory distractions, perceived privacy, and satisfaction with the office environment. Rather than predicting a direct effect between openness of the office and satisfaction with that setting, the model reflects the hypothesis that the relationship between these two variables is mediated by perceptions of the environment such as perceived privacy and aural distractions. Path analysis of questionnaire and observational data obtained from 288 participants in eight organizations provides support for the model. Methodological issues regarding the use of path analytical techniques and implications of the model for the design of office environments are addressed.

INTRODUCTION

There is presently a debate within the office design research literature over the role of the office environment as a determinant of employee attitudes and behaviors. Of particular interest in this debate are open-plan offices--including multicellular, office landscape, and systems offices--which have become increasingly prevalent in recent years (see Lorenzen & Jaeger, 1968; "Office landscape," 1964; Shuttleworth, 1972). Surveys of office workers taken during this period have found correlations between the degree of openness of the office and negative outcomes such as dissatisfaction and decreased productivity (e.g., Brill, 1981; Steelcase, 1978, 1980). These correlational surveys are frequently cited as evidence that open offices cause dissatisfaction among workers. It is this assumption which is the focus of the research project reported in this paper.

Employee dissatisfaction with the degree of enclosure of offices has been discussed in national business publications (Rout, 1980; "The trouble with open offices," 1978), with much of the literature implying that dissatisfaction may be an unavoidable side effect of open offices. A majority of the environment-behavior literature examining office design issues has attempted to understand this open office/dissatisfaction relationship by evaluating various conditions often associated with open-plan offices (e.g., increased noise levels, high visibility to others, and employee perceptions of decreased status and territorial control). Such a piecemeal approach may be necessary in the early stages of research in any subject area. Unfortunately, office design research has not progressed beyond the use of this approach to the point of integrating variables into models of the office system. This report describes an attempt to begin this integration.

Limitations of Past Research

Despite heightened research interest, three recurring and pervasive methodological problems have limited progress toward understanding the influence of the physical environment on employee attitudes and behaviors. First, virtually all the existing research has attempted to base conclusions on case studies or comparisons of small numbers of settings. Differences between open and closed offices have in most cases been investigated by administering surveys to similar organizations in different office complexes (e.g., Mercer, 1979) or by polling the same organization before and after moving to new, open-plan offices (e.g., Oldham & Brass, 1979). These approaches frequently lack appropriate experimental control groups and as a consequence the results have limited generalizability.

Another methodological flaw present in office research is reliance upon the use of subjective measures. While the attitudes, values, and beliefs of research
participants must frequently be assessed using self-report survey techniques, it is both possible and desirable to also use observational or archival techniques to gather information concerning the physical environment, the organization, and the participants. The use of such objective techniques is important for two reasons: it allows the investigator to provide accurate descriptions of the setting, thereby facilitating both generalization and practical application of the findings to other settings; and it creates the opportunity to assess convergent validity when multiple measures of the same property or attribute are collected.

Finally, the use of research designs which preclude interpretation of causal relationships among a set of variables has limited the conceptual development of office design research. Field research projects often do not meet the requirements of experimental research designs (e.g., random assignment of subjects to conditions) and so correlational studies predominate within the office research literature. As a result, assumptions concerning the causal ordering of variables have not been tested, and theory building and integration of office design research into design practice have been limited.

Several office design studies reported in the literature have avoided two of the three methodological difficulties discussed above; hypotheses have been tested using non-correlational research techniques (e.g., Oldham & Brass, 1979) and statistical relationships among constructs have been explored (e.g., McCarrey, Peterson, Edwards & vonKulmiz, 1974; Nemecek & Grandjean, 1973). However, none of the research has resulted in generalizable, reliable data regarding the mechanisms by which open-plan offices influence office workers.

Model Development

The third research problem discussed above, the use of non-causal methodologies, is perhaps the most difficult to surmount. In order to clarify hypothesized causal relationships prior to designing a research project, it is frequently useful to develop a conceptual model. Appropriate methodologies for analyzing the relationships depicted in the model may then be more apparent.

The conceptual model created for the present study is shown in Figure 1. This model is based upon theoretical models of employee responses to office environments proposed by a number of authors including Klimoski (1979), Marans and Spreckelmeyer (1980), and Schuler, Ritzman, and Davis (1980). Briefly, this model specifies that organizational variables such as organizational structure, objectives, and technology influence decisions about the physical environment which the organization occupies. Organizational variables also relate to employees' perceptions and responses to the environment. And finally, the physical setting of the office exerts an influence on employee perceptions which in turn determine responses to the environment.

Three points should be emphasized regarding this conceptual model. First, the model incorporates the three most commonly proposed elements of environment-behavior analysis—the organization, the physical setting, and individuals—and illustrates the interactions among these components (Building Performance Research Unit, 1972; Weisman, 1982). Omission of any of these elements from a model severely limits its theoretical value. Also, the model represents an open system; factors not included in the model (e.g., economic conditions, building codes, cultural differences) may influence components within the system. The third and perhaps most important feature of the conceptual model in Figure 1 is the indication that properties of the physical environment only indirectly influence
one's responses to the environment by shaping environmental perceptions.

In order to operationalize and evaluate the conceptual model, variables were selected representing each component of the model. Selection criteria included relevance of each variable to the open office controversy and the existence of research literature suggestive of relationships to other variables within the system. Five of the eight variables included in the study are presented in this paper.

Figure 2 corresponds to Figure 1, but portrays the variables used in the study. The organizational component of Figure 1 is operationalized as job level (for instance executive, managerial, professional, or clerical) which is frequently a determinant of one's office environment and may also influence an employee's response to open-plan offices (Sundstrom, Herbert & Brown, 1982; Sundstrom, Town, Brown, Forman & McGee, 1982). Aural distraction and reduced perceived privacy (two environmental perceptions) have been found to be significantly correlated with the degree of openness of the workspace (Hundert & Greenfield, 1969; Nemecek & Grandjean, 1973) and may mediate the relationship between a property of the physical environment (in this study degree of openness) and satisfaction with the workspace (Sundstrom, Burt & Kamp, 1980; Sundstrom, Herbert & Brown, 1982). If such a mediated relationship exists, there may be no direct effect of openness on workspace satisfaction, therefore no indication of such an effect is portrayed in Figure 2.

Research Strategy

The research strategy developed for this study permits evaluation of the model of employee responses to the office environment (Figure 2) while avoiding the methodological problems reviewed previously. This strategy involves three tactics:

1) Sampling organizations having a broad range of office settings and categories of office workers, in order to maximize the ability to generalize from the study.

2) Assessment of the degree of openness of each participant's workspace by both objective (i.e., investigator collected) and self-report measures, thereby improving the study's validity.

3) Use of appropriate analytical methods for evaluation of the relationships hypothesized in Figure 2.

The first two tactics should be clear to the reader and will be discussed in more detail later in this report. The last tactic however requires elaboration.

Since the model in Figure 2 specifies causal relationships among a set of variables, it may be characterized as a structural model (Heise, 1968). In contrast, estimation models, such as those normally used in multiple regression, only allow analysis of the variance accounted for by the variables in the model and estimation of parameters for a given variable. When estimation models are employed, one is not required to specify the patterns of causation among variables prior to statistical analyses, nor can one correctly test such patterns. Therefore, analysis of structural models provides not only the information available from an estimation model,
but also knowledge regarding the hypothesized causal relationships among a set of variables.

Path analysis (Duncan, 1966; Wright, 1934) is one means of statistically analyzing structural models and was selected for the primary analyses of the project data. While path analysis does not allow one to "prove" causation, it does provide a statistical means of testing a model in which a causal ordering is hypothesized, and thus of making quantitative an interpretation which would otherwise be merely qualitative" (Wright, 1934, p. 276). It is therefore a particularly useful procedure for advancing the development of theories and overcoming interpretation problems inherent in the use of non-causal analyses.

METHOD

Research Settings and Subjects

Office workers at eight organizations participated in the research project. These organizations provide management and administrative support for banking, manufacturing, educational, research, and publishing activities. A variety of office types, ranging from traditional private offices to large open areas housing 40 to 50 employees, are provided by each of the eight firms.

Between 20 and 66 employees at each organization participated in the project for a total of 360 subjects. These employees work at all levels in their organizations and fill many of the functional roles typically associated with office work.

Research Materials and Procedures

A questionnaire containing three to 13 items assessing each variable was developed by the investigator based upon conceptual discussions of the variables in the architectural, environment-behavior, management, and psychological literatures. Responses to the questionnaire items were indicated on five-point Likert scales or using multiple response categories. Instructions and a letter of introduction from an executive in each organization (e.g., personnel director, company president) were distributed to participating employees along with the questionnaire.

Descriptive information regarding the degree of enclosure present in each respondent's workspace was recorded by the investigator on a separate data collection form. Concepts of real and perceived openness of the physical environment provided in the literature (e.g., visual access, Archea, 1974; number of workers in room, Canter, 1972; accessibility, Sundstrom, Herbert & Brown, 1980) were operationalized as objective openness measures for use in this project.

Questionnaires were distributed to employees' workspaces early in the day. After distributing the questionnaires, the investigator returned to each workspace to record the openness measures described above. This procedure was relatively unobtrusive and took about five minutes per workspace. Near the end of the workday the questionnaires were personally collected by the investigator in order to maintain confidentiality.

RESULTS

Evaluation of the Data Collection Instruments

Questionnaires were returned by 325 (90%) of the 360 office workers asked to participate. However, an additional 37 (10%) of the questionnaires were discarded for one of four reasons: 1) the respondent did not perform typical office work, 2) the respondent had occupied her/his workspace less than three months, 3) on a typical day the respondent worked away from his/her workspace for more than five hours, or 4) the questionnaire was incorrectly completed. Questionnaires and observational data for the remaining 288 participants were utilized in all analyses.

Measures of each of the five variables were evaluated in terms of item-total and inter-item correlations and unreliable items were eliminated. A value for each scale was created by standardizing items and averaging the standardized scores. Standardization was necessitated by the fact that response formats varied across items within each scale. An additional problem, unequal numbers of items in the scales, created the requirement that the item means be used for the scale values rather than simply totaling the item scores.

Items used to construct the five scales are presented in Table 1. The corrected item-total correlation for each item reflects the correlation between that item and the total of all other items in that scale. In addition, measures of the internal consistancy and reliability of the scales--mean inter-item correlation
### TABLE 1
**SCALE ITEMS AND STATISTICS**

<table>
<thead>
<tr>
<th>Items</th>
<th>Corrected Item-Total Correlation</th>
<th>Mean Inter-item Correlation</th>
<th>Standardized Coefficient</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aural Distractions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentration frequently distracted</td>
<td>.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequently annoyed by noise</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise interferes with job performance</td>
<td>.80</td>
<td>.67</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>Noise level too high</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise makes talking difficult</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workspace usually quiet</td>
<td>-.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied with noise level</td>
<td>-.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to concentrate</td>
<td>-.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Job Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of job</td>
<td>.59</td>
<td>.59</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>Number of persons supervised</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Privacy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel like on display to others</td>
<td>-.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very little privacy</td>
<td>-.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very few activities unknown to others</td>
<td>-.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can hear others' conversations</td>
<td>-.47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More private than other workspaces</td>
<td>.55</td>
<td>.48</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>Have time to myself</td>
<td>.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others know little about my conversations</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low visibility to others</td>
<td>.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfactory level of privacy</td>
<td>.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to have private conversations</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Satisfaction with Workspace</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would like to change workspace</td>
<td>-.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult to do job in workspace</td>
<td>-.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like my workspace</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like a different type of workspace</td>
<td>-.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied with workspace</td>
<td>.82</td>
<td>.55</td>
<td>.92</td>
<td></td>
</tr>
<tr>
<td>Satisfied with size of workspace</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like arrangement of workspace</td>
<td>.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like location of workspace</td>
<td>.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied with workspace furnishings</td>
<td>.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Openness of the Workspace</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visibility to others</td>
<td>.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to see others</td>
<td>.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workspace very open</td>
<td>.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of walls around workspace</td>
<td>-.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door on workspace</td>
<td>.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of workspace</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of persons in room</td>
<td>.89</td>
<td>.55</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>Degree of enclosure</td>
<td>.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual access</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of workspace</td>
<td>-.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of room workspace located in</td>
<td>.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of persons in 400 sq ft area</td>
<td>.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual exposure</td>
<td>.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to nearest neighbor</td>
<td>-.44</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Measures recorded by the investigator.
** All other measures reported by respondents on questionnaire.

and Cronbach's standardized coefficient alpha--are provided.

**Evaluation of the Structural Model**

Tests for linearity and additivity--assumptions of path analysis--were conducted prior to performing the path analysis (Billings & Wroten, 1978). No violations of the assumptions were detected.

The "theory trimming" approach (Heise, 1968) was used to test the feasibility of the structural model in Figure 2. This approach involves statistically analyzing a model in which causal paths between all the possible pairs of variables are specified (i.e., a "completely specified" model). Since the structural model for this study (Figure 2) specified paths between all pairs of variables except openness and satisfaction, creation of a completely specified model for this case
required only that a path between these two variables be assumed. Path analysis provides a statistical basis for deciding which, if any, paths to delete from the completely specified model in order to produce a more parsimonious or "reduced model" (Kerlinger & Pedhazur, 1973). The reduced model is then statistically evaluated to determine if any paths critical to the model have been deleted. If not, the reduced model may be compared to the structural model to determine the similarity of the two models.

Path coefficients for the completely specified model are shown in Table 2(a). These coefficients may be interpreted in roughly the same way one interprets correlation coefficients. However, path coefficients reflect only the direct effect of one variable on another and so differ from correlation coefficients which are indicative of 1) direct effects, 2) indirect effects transmitted from one variable to another through other variables in the model, and 3) correlations between the two variables of interest and a third variable not included in the model. Also, the path coefficient for any relationship A -> B will not be the same as the path coefficient for B -> A as would be the case for the A - B correlation coefficient.

The theory trimming procedure resulted in the deletion of four paths from the completely specified model: paths from job level to aural distractions, perceived privacy, and satisfaction with the workspace; and the path connecting openness of the office to satisfaction with the workspace. Coefficients for these paths were not statistically significant at the .01 level. Deletion of the three paths involving job level are the only changes to the relationships hypothesized in Figure 2 suggested by the path analysis. Figure 3 illustrates the reduced model and the path coefficients for the remaining paths.

Statistical evaluation of the reduced model is possible using correlation coefficients. If correlations computed from the path coefficients of the reduced model adequately reproduce the actual correlations among the variables, there is evidence that the reduced model accurately reflects the obtained data (Duncan, 1966); the reduced model may then be assumed to
accurately portray the relationships among the variables. The actual correlations and those estimated from the path coefficients associated with the reduced model are shown in Table 1(b) and (c). Comparison of these values indicates that the reduced model adequately reflects the data collected in the project (likelihood ratio = 2.42, p > .05).

DISCUSSION

This study evaluates the plausibility of the model of employee responses to the office environment proposed in Figure 2. Figures 2 and 3 are quite similar, indicating support for the model hypothesized at the outset of this project. Revisions of the model which appear necessary involve three paths from the organizational variable: job level. The remainder of the structural model is confirmed by the data.

The primary concern in this study is the relationship between openness and satisfaction with the office. As Figure 3 illustrates, the relationship is mediated by distractions due to noise and perceived privacy. The path coefficient for a direct effect between openness and satisfaction (shown in Table 2(a)) is .01, demonstrating a negligible direct influence. While it seems likely that there are other variables which may also mediate the openness/satisfaction relationship, the two mediating variables used in this study account for a majority (54%) of the variance in multidimensional satisfaction with the office.

Studies which have examined the correlation between the degree of openness and satisfaction have typically obtained coefficients between -.25 and -.50. This has led investigators to conclude that the two phenomena are related. Indeed, in the present study a correlation coefficient of -.40 was found for the relationship. However, as discussed above, the path coefficient for the direct effect of openness on satisfaction was near zero (.01). Therefore, the inflated correlation is almost entirely due to indirect effects. Confusion about dissatisfaction with open offices has continued unnecessarily because traditional correlational research could not distinguish between direct and indirect effects.

Based upon the existing research literature, relationships between job level and the other four variables were hypothesized. However, the path coefficients indicate that the strength of three of the relationships—that is, with distractions, privacy, and satisfaction with the workspace—is minimal, while the relationship between job level and openness is relatively strong (-.38). This suggests that this particular organizational variable produces a greater influence upon the type of workspace the person is assigned than upon the individual's perceptions of the work environment.

Further research is necessary in order to substantiate the model developed in this study and to assess the role of other variables (e.g., perceived status, visual distraction) in this set of relationships. However, several implications of the model may be proposed at this time. It appears that office workers may incorrectly attribute dissatisfaction with their offices to the physical properties of openness rather than to the perceptual consequences of openness such as distractions caused by noise and lack of privacy. This suggests that designers wishing to improve employee responses to open offices should strive to maximize privacy and minimize distractions.

Another implication of the results contradicts the belief of many designers and managers that persons at higher job levels are less satisfied with open offices. The symbolic value of a closed office as an indicator of status and job level is quite important (see Konar, Sundstrom, Brady, Mandel & Rice, 1982), but as Figure 3 illustrates, job level alone produces little influence on employee perceptions or satisfaction with the office. This indicates that persons at different job levels may be equally satisfied with open offices.

In conclusion, this project illustrates that it is possible to conduct field research on office environments without encountering critical methodological difficulties which may limit the value of the research. A representative range of settings can be sampled, objective measures collected when appropriate, and research procedures employed which facilitate development of causal models and integration of previous research. Benefits which accrue from this extra effort may include more generalizable findings and information of value to both office designers and managers in their efforts to provide facilities which are appropriate for both the tasks which must be performed, and the social and psychological needs of office workers.
ACKNOWLEDGEMENT

The author gratefully acknowledges the support and advice provided by Gerald Weisman during the preparation of this report and throughout this research project.

FOOTNOTES

1 A dissertation reporting the complete project is forthcoming.
2 The questionnaire, observational data collection form, and descriptive statistics for items and scales are available from the author.
3 Correlated error terms, a frequent problem in path analysis, are normally manifested in nonlinear relationships and/or nonadditive effects. This problem is not probable in these data given the high reliability coefficients (therefore low error of measurement) and the absence of nonlinear relationships and nonadditive effects.

REFERENCES


Brill, M. Design of the work place. Invited session at the meeting of the Environmental Design Research Association, Ames, IA, April 1981.


Office landscape. Progressive Architecture, 1964, 45(9), 201-203.


Way-Finding in Public Spaces: The Dallas/Fort Worth, USA Airport.

Andrew D. Seidel
The University of Texas at Arlington

Abstract

This is a study of arriving passenger way-finding performance in one terminal building of the Dallas/Fort Worth Airport. The way-finding experience of passengers arriving at two gates, each of which had a different path to the baggage claim area, is compared. The results indicate that there is a difference in the way-finding experiences between the two arrival gates but that more precise methods of way-finding are needed to measure more accurately such environmental effects.

Introduction

When this study began, there were convincing anecdotal reports from the popular press, described below, to believe that passengers had trouble finding their way. We received very strong cooperation from Braniff International Airways since Braniff also believed passengers had great difficulty finding their way. In fact, Braniff had a passenger service representative meet each arriving airplane in order to provide directions.

The airport, one of the largest in the world with a land area larger than Manhattan Island, is the fifth busiest in the United States. Yet, if one were to believe the popular press, passengers were to be seen aimlessly wandering the tarmac, possibly babbling and drooling, simply lost beyond any comprehension of their environment. A few examples from the press reports will suffice here.

Kilday (1979) notes, "each year countless visitors to the nation's largest airport collapse under the stress of travel - some so severely that they are taken to nearby hospitals for psychiatric evaluation. ... (Airport officials') figures show that as many as 20 to 30 people each year are involuntarily committed for psychiatric examination in a ... hospital because of their erratic behavior at the airport. Many more appear to be suffering a nervous breakdown."

Numerous other popular publications reported on difficulties with D/FW Airport. For example, Ivins, in Esquire (1976) writes, (p. 101) "The Dallas/Fort Worth Regional Airport may be the worst in the world. ... ... (T)he general tenor of the defense (by the airport's administrators was that) D/FW may not be a thing of beauty, but, by God, it would work. But then it opened in January, 1974. ... D/FW had to immediately hire thirty-four 'passenger-service agents' just to direct people around the monster airport." Later, the airlines would add more such personnel: enough so that at least one would meet every arriving flight. (1)

This study focused on way-finding: the influence of the physical environment on the performance of individuals in finding their way under various physical environmental conditions. One segment focused upon the ability of passengers to find their way from the arrival gate to the baggage claim area.

Two potentially different way-finding situations are compared. Passengers arriving at Gate 11 could see the baggage claim area through a glass partition as they came into the terminal. Passengers arriving at Gate 9 could not. They had to follow the signs. The way-finding literature noted below would indicate that these two groups of passengers would indeed report differential way-finding experiences.

The Setting

D/FW has a standardized terminal building. (See fig. 1.) Each terminal building is semi-circular in design. The walking length from one end of the terminal building under study to the other end is slightly over one-half mile. The radius of the curvature of the terminal building is approximately 900 feet. The cross-section width of the building interior is approximately 114 feet. The center of the semi-circle is used for automobile parking. The tarmac side of the terminal building is lined with gates and gate lounges. The roadway side of the building is lined with bag claim areas, offices,
ticket counters and miscellaneous stores and restaurants. In schematic it is especially a linear design where the departing passengers can drive to a building entrance very near their departure gates. How did this airport design come about?

D/FW was in large part designed by the original Executive Director of the airport administration. He had previously been the executive director of several large international airports, one of which had semi-circular terminal buildings similar to those of the D/FW Airport but on a much smaller scale; his experience with the design and management of airports was considered to be substantial. By numerous accounts, from interviews with present airport personnel who were with the airport administration at the time of the D/FW Airport's beginning, the director was given a virtually free hand in supervising the airport design. This is important because the airport had no architectural program. Jack Downey, Assistant Executive Director of the airport administration, when asked to provide a copy of the program for the building said, "I am surprised you would ask. I am surprised you would even think there would be such a thing. No, this airport was designed in memos between the lead architect, the local architect, and (the first executive director)." While some might consider such remarks alarming, Mr. Downey only was expressing his view that no project this large had ever been attempted before and that, therefore, thorough programming would have been impossible. Whether a program would have yielded a better project must remain a subject for conjecture since there is no direct comparison. It suffices to note that the airport was programmed through a highly incremental process.

In 1972, when the airport's Board of Directors was seeking approval to sell bonds to finance the airport, it published a booklet that described the planning efforts that had gone into the airport. While one must, of course, consider this a publicity piece, it provides some wonderful food for thought. It notes, "The Dallas/Fort Worth Airport is the most thoroughly planned air facility ever constructed.... The goal in all planning was an airport free of restraints -- a system that would give both passengers and aircraft the easiest possible access. ... The result is that the Dallas/Fort Worth Airport is one of the easiest major airports to use in the country." (p.1.) Thus, they set their stated goals.

According to McCartney (1982), the airport serves 22 million travelers per year and has a daily staff of 15,000. On a median day, approximately 75,000 people use the airport services, the population of a fairly sized city.

At the time of the study the airlines, after seven years of use, are beginning to reject the airport terminal design. Bauer notes "the futuristic design of the Dallas/Fort Worth Airport... is being abandoned in the construction of a new American Airlines terminal" This new terminal will return to the "torso and arms" design (see fig. 2) and, it is expected, will minimize way-finding difficulties. In the "torso-and-arms" schematic design, the gates are located in the "arms" and all centralized facilities like baggage claim, ticketing, etc. are located in the "torso". If you are lost, simply head toward the central building, the "torso".

Therefore, for this study of the two arrival gates, since the path from each gate to baggage claim is different, the research expectation would be that passengers arriving at Gate 11, who could see the baggage claim area and baggage claim carousels, would report an easier way-finding experience than passengers arriving at Gate 9 who would have to find their way to the baggage claim area via the signs, asking directions, or by trial and error. (See figure 3.)

**REVIEW OF THE WAY-FINDING LITERATURE**

Many elements may cause airports to attract people who exhibit the signs of disorientation which were reported in the popular press. For example, Shapiro (1977) notes that airports can generally attract individuals with psychological problems. He examined patients brought to him from New York City's Kennedy International Airport.

He writes that an airport, because of its easy accessibility, can serve a number of psychological functions for society's downtrodden with no place else to go. But, this is not likely to be the case at D/FW because of its distance and inaccessibility from the population centers. Therefore, at least as far as Shapiro's results are concerned, one would expect that any way-finding difficulties found at D/FW Airport to be more likely to be related to environmental than personal characteristics. Unlike J. F. Kennedy Airport in New York which he studied, no inexpensive public transit serves D/FW
Airport and it is 17 miles from the
downtowns of either major city it serves.

Zimring (1981, p. 159-160) notes, "The
literature abounds with other anecdotal
accounts ... less dramatic [than D/FW
Airport], yet still important, impacts of
becoming disoriented or lost in the
designed environment." Berkeley (1973)
asserts that both visitors to and regular
users of Boston City Hall frequently
experienced way-finding difficulties.
Similarly, in an evaluation of the Arts
and Architectural building at the
University of Illinois Chicago Circle
Campus, it has been asserted that the
circulation pattern "... seriously upsets
the orientation of everybody who uses the
building ... the first reaction among
people who pride themselves on their space
perception is 'indignation'." (Dixon,
1969, p. 75.)

Sivadon (1970) provides a description of
the French Radio and Television Building
in Paris. The circular plan of the
structure limits one's visual access to
one's destination. In attempting to
become purposely lost within the building,
Sivadon notes that he was able to "... recapture the anxiety of being lost" (p.
415). McKean (1972) has reported
way-finding difficulties in academic
buildings; Bronzaft, Dobrow, and O'Hanlon
(1976) in subways; and Izumi (1970) and
Salvak (1967) in hospitals and psychiatric
institutional settings. To Lynch (1960, p.
1) "the very word 'lost' in our language
means more than simple geographical
uncertainty; it carries overtones of utter
disaster."

Evans, et al. (1980) report a study of
fourteen undergraduates who demonstrated
that the use of signage and color can
improve way-finding performance to a
statistically significant degree even with
a small sample. They followed fourteen
randomly selected undergraduate students
each of whom had been given a tour of a
certain building and were then asked to go
sequentially from one of three points to
another and then the final point. The
order of the points was randomly mixed for
each student. Evans, et al. used as their
unit of measurement each time a student
deviated from the shortest path to the
prescribed locational goal.

Numerous other authors have indicated that
signage at choice points (Best, 1970,
Corlett, Manenica, and Bishop, 1972)
improves way-finding performance.

The research literature provides a number of
different operational definitions of
"lostness" as, the degree to which a
person does not follow "the most direct
route". This is not at all a surprising
conclusion but this definition of
"lostness" is inappropriate to D/FW. In
an airport, the most direct route per se
may not even exist for people who may
simply be "killing time" waiting for their
bags, perusing magazines at the news stand
or other non-directed activities. While
they are on a direct route to the baggage
claim area, this route may be interrupted
by many other activities distorting any
notion of what a "direct" route is. The
assumption of simple efficiency as an
objective may simply be incorrect in a
transfer station like D/FW airport.

Weisman administered a short (10 question)
questionnaire to 73 students at the
University of Michigan in ten different
buildings with which the students were
expected to be familiar. The survey
instrument asked them to report their
feelings of "lostness" and their ability
to direct a stranger. Each questionnaire
applied only to one building. While
Weisman does not fully define the concept
of way-finding, he does present three
strategies individuals may use to
negotiate an environment. These three
strategies are: (1) an individual may have
a clear visual overview of an environment,
his or her destination or the path through
the environment to that destination; (2) an
individual may have a cognitive mental
representation of the environment to guide
his or her way through it; and (3) an
individual may have successive cues (e.g.
signs) at choice points within an
environment. Weisman notes (1979, p.41),
"... there are indications that the
selection of a (way-finding) strategy may,
at least in part, be environment
dependent; a particular environmental
context will likely make one strategy more

131
effective or economical than others." By this Weisman clearly means that where differences in environments exist, differences in the ability of an individual to employ each of the three way-finding strategies noted above should also exist and there should be respondent-reported differences in way-finding experiences.

Weisman bolsters this argument by citing Gibson who reports, "... the act of going to an object or place beyond the range of vision represents a much higher and more complicated level of mobility than that confined to a spatial field where optical stimulation yield all the necessary cues because the goal object lies within it." (Gibson, 1950, pp. 229-230 in Weisman, p. 41.)

Weisman continues (p. 44) "Thus it may be seen that there are alternative strategies for way-finding; these range from the most basic blind orientation, to tracing a sequence of decision points (without necessarily being able to conceptualize the total trip or the entire environment), to possessing extraordinarily detailed and accurate mental maps, which can be reconstructed from memory at will. In all cases, the fundamental requirements of way-finding-- recognition of present location and its relationship to other, desired locations -- remains the same."

However, Weisman, countering intuition, also notes that the frequency with which an individual has used one of the environments he studied, the recentness of use; or the extent of usage had no relationship with way-finding performance. He writes (p. 31), "study data do not suggest any particular simple relationship between familiarity and way-finding behavior (specifically frequency of disorientation). ... Correlational analyses ... yielded no significant relationship between familiarity and reported way-finding behavior."

Those are the only non-anecdotal, at least partially experimental, attempts to measure way-finding performance known to this author. It would, therefore, appear that the researcher should expect the respondent to be able to accurately report his or her own behavior and would honestly admit to becoming lost if that were the case.

It should be noted that in each of these studies that actual percentage of respondents exhibiting way-finding difficulties is quite low. Weisman notes (p. 35) "Averaging across the sample of buildings, 9.1% of respondents reported becoming lost fairly often or almost always; 14% reporting having, on at least one occasion, been quite or totally lost." Best reported only 17% of those interviewed had become lost. Evans, et al., unfortunately, gave no such figure.

In summary, the literature overall would indicate that since the path to the baggage claim area from each gate is different, and since passengers arriving at one of the gates under study have a direct view of the baggage claim area, passengers should report different way-finding experiences. However, it is also indicated that only a small percentage of the the entire sample should report way-finding difficulties.

METHODOLOGY

Respondents were asked to rate their own way-finding performances in two ways. First, each was asked to draw his or her path on a plan of the terminal building and indicate any particular place where he or she had received cues or asked directions about how to get to the baggage claim area. Each was also asked to indicate any point at which he or she was unsure about which way to go. The plan was clearly marked showing the gates, corridors and all the stores, rest rooms, etc.

Second, each was also asked a number of questions through the use of a questionnaire about their way-finding performance. These included: (a) "Was finding your way through the terminal confusing to you?"; (b) "Did you find the signs unclear?"; (c) "Do you find this place a relatively easy or a relatively difficult place in which to find your way?"; (d) "Have you ever had trouble finding your way or have you ever been 'lost' inside this building"; and (e) "How 'lost' was that?" For each of these questions, respondents were handed a card showing the question and the four-point scale on which to respond.

Lastly, respondents were also asked the reason for which they were travelling, their age, how frequently they have used this terminal and to indicate their occupational category. Note was also made of the gate at which each respondent arrived, the time the interview began and ended and the sex of the respondent. All respondents were interviewed in the same baggage claim area.
THE DALLAS/FORT WORTH AIRPORT RESEARCH

This study relied on a multiple method strategy using a small sample of behavior tracing and a medium-sized sample of respondent self-reporting.

One might argue that it is always better to observe and measure behavior than to ask respondents to report on their own behavior. While passengers could be followed through the terminal and their paths traced, to do so is very time consuming and therefore potentially very expensive for the information obtained. Also, since destination is unknown, with one possibly only to "look around", it is unclear that following passengers would yield valid information about way-finding performances. The "shortest route" assumption cannot be considered valid when examining behavior in airports. Therefore, a multifaceted strategy for data collection was used here.

To overcome at least partially the potential problem that respondent-reported behavior would not match actual behavior, a systematic random sample of passengers arriving at the two arrival gates was followed and their paths recorded on a plan of the terminal building. Thirty passengers from each gate were selected. Days were randomly sampled within which flights were also randomly sampled and for each flight a randomly chosen deplaning passenger was chosen to follow. Of these sixty passengers, those who went to the baggage claim area were interviewed and asked to trace the path they followed from the arrival gate to the baggage claim area on a plan of the terminal. This amounted to 47 passengers (thirteen of those passengers who were followed did not go to the baggage claim area). They were encouraged to show all false paths and correct paths they took or stops they made on the way. Forty-five of the 47 passengers so interviewed were correctly able to draw or describe the path each had followed to the interviewer.

These passengers were asked (1) to answer the questions on the topics noted above; (2) to draw the path they took on a plan of the terminal which we provided; and (3) to indicate any points in their path at which they felt confused. All of the individuals agreed to be interviewed. A complete set of data, which included the drawing of the path they had followed to the baggage claim area, was obtained for each of the 95 individuals. The interviews lasted an average of 5 minutes. Once the bags began to arrive on the carousel the interviewer completed the interview in process and stopped interviewing for that flight.

Interviewing passengers while they were waiting for their baggage, of course, posed certain bias problems. While it provided an opportunity to interview passengers at a point when they were not hurrying to another location, it did exclude those passengers travelling without baggage or who carried their luggage onto the plane with them. One would expect that these latter groups who carry their bags onto the plane with them or who travel without bags are the more frequent travellers who have purchased the type of luggage that one is permitted to carry onto the airplane. These more frequent travellers, one would expect, would be less likely to experience difficulty negotiating the airport.

Therefore, the results reported below are from the questionnaire responses of only those passengers who had checked baggage.

RESEARCH EXPECTATIONS AND DISCUSSION

The overall research expectation is that respondents would report differential way-finding experiences depending on the gate at which they arrived. Those who arrived at Gate 9 had to follow the signs to find the baggage claim area. Those who arrived at Gate 11 had a direct view (through a glass partition) of the baggage claim area. Therefore, those arriving at Gate 11 should be less likely to report a difficult way-finding experience. If there is a difference in way-finding experiences, this would provide confirmation for the above research expectation.

However, what if there are no or few differences? This could have a number of interpretations. One, it could mean that the literature is simply incorrect. Two, it could mean that effects of the environment on way-finding are very small and that even with the sample size used
here, larger than previous studies, the sample is still too small to permit a statistically significant difference since so few people in any given population report becoming lost (c.f. Best's and Weisman's studies reported on above).

Three, it could mean that following signs is almost the same as having a direct view of the destination although Weisman would lead us to believe this should not be true. Four, it could also mean that people don't like to admit that they're confused. If that is the case, perhaps surrogate measures, such as reported ability to direct a stranger or knowledge of how to get to where they're going next, might be more accurate measures of way-finding performance, worthy of further development. All of these and possibly others are possible interpretations.

RESULTS OF THE ANALYSIS

Given the above discussion of the strong anecdotal evidence of way-finding difficulties at O/FW Airport, the results are indeed very interesting. Of the total respondents who had arrived at either gate, 98.3% (n=33) said that finding their way through the terminal was "not really confusing" or "perfectly clear". When asked if the signs were unclear, 75.9% (n=70) of the total respondents from both gates said the signs were "not really unclear" or "perfectly clear". So it would appear that on the whole, passengers reported very little difficulty in this airport terminal which was reported by the popular press to be so difficult. The 11.7% and 23.1%, respectively, should have been the approximate number expected to indicate difficulty if prior studies provide any guidance. While approximately one-fifth of the passengers reporting difficulty is a small percentage, this may represent a very large number of individuals since the average number of people using the airport each day is approximately 75,000.

However, when asked "Do you think you'd be able to direct a stranger to many places inside this building," 72% answered "practically nowhere" or "only a few places". And, still, only 34.8% of those who said they could direct a stranger said they would be "pretty certain" or "quite sure" of the directions they would give. If the terminal is so clear to them, why, at a minimum, can they not direct someone to follow the signs?

From the paths the respondents drew on the terminal plans and from their reports of any at least momentary way-finding difficulties, there was no statistically significant difference in the number of instances of way-finding difficulty between those coming from Gate 9 and those coming from Gate 11.

When one examines the other general comments solicited in an open-ended question at the end of the questionnaire, one finds a nearly identical split between good and bad comments about finding one's way within the airport terminal for both gates. Of those who volunteered such comments, 73.9% made positive comments and 26.1% volunteered negative comments about their route from Gate 9. For Gate 11, the split was 72.7% and 27.3% respectively.

However, 99.1% of those from Gate 11 said the building was easy to figure out while only 11.4% from Gate 9 said so. This difference was statistically significant at p<.0355 (using a Chi-square test) indicating support for the research expectation.

Of those who felt the signs were unclear (n=45, 45.9% of the total sample from both gates), 29.2% of those arriving at Gate 9 said there were too many signs while only 4.8% of those arriving at Gate 11 said so. (Gate 11 had direct visual access to the baggage claim area.) This is statistically significant at p<.0327 (using a Chi-square test). Of course, those coming from Gate 9 had more signs to follow because of the greater distance of Gate 9 from the baggage claim area. However, this question asked whether there were too many signs. This result would indicate that those coming from Gate 11, since they may not have needed any signs to see the baggage claim through the glass partition, were less likely to report there were too many signs than respondents who arrived at Gate 9 who had to follow the signs to the baggage claim area.

Thus, there is some evidence to support the expectation that passengers arriving at the gate with direct visual access to the baggage claim area had an easier way-finding experience. However, for the other questions about the way-finding experience, listed above, there were no clear differences in performance between the two gates.

EFFECT OF FREQUENCY OF PRIOR USE OF THE TERMINAL BUILDING

As noted above, Weisman indicated that frequency of use of the environment did not appear to be related to way-finding performance. This is clearly not the case
The frequency with which the respondent had used the building has a statistically significant relationship with the measures of way-finding performance. Specifically, the more respondents had used the building, the more likely they would be of the directions they would give to a stranger (p<.0001, using a Chi-square test). Also, the more they had used the building, the larger was the number of places within the building to which they were able to direct a stranger (p<.0001, using a Chi-square test). Similarly, the more they had used the building, the more likely they would know how to get to wherever they were going after visiting the baggage claim area (p<.0007, using a Chi-square test).

So, it would appear that frequency of use would have a relationship to way-finding performance. Unlike Weisman's findings, the more a respondent had used the terminal before, the more likely the respondent was to report ease of using the building.

CONCLUSIONS AND RECOMMENDATIONS

Future research needs to concentrate on the measurement question. It is insufficient to attempt to create studies (like those of Best and Evans, et al., who should be commended for their pioneering work) which analyze behavior in settings that may not accurately model human behavior outside the experiment or with assumptions such as the shortest route to the objective is always best. While the attitudinal survey responses, like those used by Weisman and in this study, may be sufficient to pro-duce the information necessary to guide architectural or urban design, they are also clearly insufficient given the possible propensity of respondents not to accurately report their own experiences. They also apparently assume that respondents' way-finding behaviors are always on the conscious level. While this study has clearly not found solutions for all these concerns, it is hoped that it has begun to raise the theoretical and methodological difficulties of studying and clarifying the concept of way-finding in real environments under real conditions.

In the case of an airport, there may be a threshold effect: respondents usually do not report being lost unless their feeling of being lost is above a certain threshold. In other words, they expect to be lost to a certain degree, a degree which undoubtedly varies with each respondent, and only if they are more lost than usual do they report themselves as having gotten lost at all. It is unfortunate that this has not yet appeared in the way-finding literature and was not systematically examined in this study. It was only after the interviews had begun that it came to the researcher's attention. It, too, however, should be examined further in future studies.

However, it must be admitted that the different environmental characteristics of the two gates only partially influenced way-finding experiences. If any such direct measurement of reported way-finding performance is to be successfully differentiated by types of real environments, given that under approximately 20% of any sample appear to admit to way-finding difficulties in any of the studies mentioned, then much larger samples will be necessary to achieve conclusive results.

Lastly, some overall comments about airport design can be made which may guide future designers of airports. How easily a passenger will find his or her way through the standard terminal building at D/FW Airport depends, at least in part, on the gate at which that passenger arrives. The airport design, by being essentially linear, rather than the more common "torso-and-arms" schematic design, may be more confusing to passengers. While no data are presently available for a similarly large "torso-and-arms" airport, one could infer from these results that since the arrival way-finding experience may be different for each gate at D/FW, it would take any particular passenger more visits to spatially "know" the airport. In the "torso-and-arms" design, such as O'Hare International Airport in Chicago, after the first few visits, the passenger knows that all the central facilities (e.g. ticketing, baggage claim, stores, other airlines' gates, etc.) can be found by heading to the "torso", the central area. Of course, this provides additional support for Weisman's (1979) conclusion concerning the role of structure. Clearly, further research would be needed to document such a conclusion.

Additionally, future researchers could hypothesize that the "torso-and-arms" design yields easier way-finding performances only because it is more familiar to respondents. This would be an extremely important factor since innovation is often considered a highly salient component of architectural design.
FIGURE 1.
The curvature of the terminal building continues so walking distance along the central corridor (A) is approximately one-half mile.

TORSO:
central facilities
(baggage claim, ticketing, stores, restaurants, etc.)

ARMS:
(airplane gates and gate lounges.)

FIGURE 2.
An E-shaped terminal was suggested by American Airlines to replace its use of the standard terminal building. Only the basic schematic has been released.

FIGURE 3.
--- Path from Gate 11 to baggage claim. --- Path from Gate 9 to baggage claim.
In such a case would innovation be bad?

At present we can only state the inferences one might draw from these results and look to future research on other similar environments to confirm or refute these inferences. However, from these inferences, we would recommend the use of the "torso-and-arms" schematic design for airports when viewing passenger way-finding considerations.

FOOTNOTES

1. From an interview with Mr. Jack Keeton, Station Manager for Braniff International at D/FW Airport.

REFERENCES


Stroudsburg, Pa.: Dowden, Hutchinson and Ross, 1976.


Shapiro, S. Psychiatric Syndromes and the Airport. Aviation, Space and Environmental Medicine, 1977, June: 555-557.


The design of public settings (such as community streets, parks, and recreation areas) should have visual appeal to the many and diverse people, who pass. Plans for such settings involve multiple users, multiple clients and a long-term development. In planning such settings, decision-makers might rely on extant knowledge of commonly held environmental preferences. Yet, frequently such information is overlooked.

Research in environmental aesthetics has made substantial progress in identifying the role of certain environmental factors in aesthetic response. With this progress, both designers and researchers face a new challenge -- bridging the gap between environmental design research and public policy. This gap differs from that (oft cited) one between designers and social scientists. This variation on the old theme reflects the separation between the development of design guidelines and their acceptance/application in public spaces through public policy. If, as environmental design researchers, we seek an improved environment for people, then we must examine the practicalities of translating professional recommendations into public policy.

This symposium centers on these practicalities. The papers deal with situations in which there are multiple users, multiple clients, and a need for a long-term scheme. Obstacles to and opportunities for success in such situations are discussed. While, on occasion, the papers refer to principles of environmental aesthetics, it is the application, not the verification, of such principles that central to the discussion here.

The papers in this symposium share an emphasis on process -- the process by which aesthetic issues can be bolstered (Chenoweth), the process by which statewide decisions were made (Ridout), the process for framing recommendations (Hurand, Kotz and Oury, and Sancar), and the process for sustaining implementation afterwards (Hurand).

A variety of forces (many more powerful than empirical data or professional recommendations) play salient roles in creating public policy. Expert information offered in professional reports is not enough. Various contexts require distinct patterns of marriage between design research and politics to bring design recommendations into physical reality. The papers here advice us of the need and methods for extending research findings into the broader arena of public policy. Chenoweth prepares the potential partner for the recurrent arguments made against considering aesthetic factors in public decisions. Ridout, through analyzing a failed attempt at integrating scenic beauty into statewide decision-making, provides directions for future engagements. Kotz and Oury argue for an interactive approach which enhances the consideration of phenomenological questions which the preference literature frequently overlooks. Hurand argue for the need for greater sensitivity to local values in choosing strategies to consummate design recommendations. Finally, Sancar, recognizing decisions about aesthetics as part of a larger system, suggests the need for an externalized understanding of that system as necessary to spawn appropriate solutions.

The papers consider decision arenas of various scales -- state (Ridout), city (Kotz and Oury), rural towns (Hurand); they utilize different bases for analyses -- case study (Ridout), synthesis of several case studies (Hurand and Kotz), and theoretical positions based on experience and analysis (Chenoweth and Sancar); and they vary in the emphasis placed on quantification of the process -- quantification strongly needed (Sancar), less technological approaches needed (Kotz). Nevertheless, the common thread tying them together is their call for environmental aestheticians to move out of the lab (be it a research or design lab) and into public policy. I think this call represents a healthy direction not only for environmental aesthetics but also for the whole of environmental design research.
OBJECTIONS TO PROTECTING LANDSCAPE AESTHETICS: A TENDENCIOUS REPLY

Richard E. Chenoweth
University of Wisconsin - Madison

ABSTRACT

Recent efforts to protect the scenic resources as a matter of public policy have proven difficult. Both government agencies and economic interest groups have objected to the creation of explicit administrative rules which would require consideration of landscape aesthetics in decision-making. Brief rebuttals are offered to the twelve most commonly heard objections: (1) there is no organized constituency for scenic beauty, (2) it is not important, (3) it's in the eye of the beholder, (4) it's subjective, (5) it can not be measured, (6) it's a matter of personal taste, (7) it can not be defined, (8) it would lead to expensive litigation, (9) there can be no agreement in ordinary landscapes, (10) protection is too expensive, (11) there is a lack of legal authority, (12) it can not be factored into the decision-making process.

SCENIC BEAUTY ISSUES IN PUBLIC POLICY-MAKING

Mollie Ridout
University of Wisconsin-Madison

ABSTRACT

This paper has developed out of a concern about the ways in which public policy affects the visual quality of the landscape. It is a descriptive case study of an effort by a group of concerned citizens to induce the Wisconsin Department of Natural Resources to adopt an administrative rule requiring consideration of scenic values in its management and regulatory activities. This effort has continued over a period of two years and participants in the policy-making process have produced a wealth of material expressing attitudes about landscape values, policy issues and administrative and management procedures.

The study focuses on three areas of inquiry. It documents those issues or problems which participants perceive as interfering with management of the visual resource, as they are framed by the participants. It examines the relationship of selected personal, professional and role characteristics of the participants to their attitudes about specific issues concerning the visual resource. Last, it examines the relationship between characteristics of the participants, characteristics of the issues or problems, and the types of forums within which the participants express those problems. The delineation of those factors is aimed at increasing awareness on the part of those who develop and present visual resource information of the specific difficulties experienced by policy-makers in understanding, accepting or utilizing such information. This documentation is a preliminary step to framing a paradigm for effective transmittal of knowledge from the realm of research to that of administration.

REGULATING THE VISUAL ENVIRONMENT: RURAL TOWNS

Fred Hurand
Eastern Washington State University

ABSTRACT

This paper centers on planning and design in the rural town context with a special emphasis on the visual quality of those environments. Frequently, rural towns are in a state of decline, and as such, represent a unique problem for planners who are more accustomed to dealing with growth. This paper explores some of the design problems facing such small towns and examines some of the planning mechanisms which can be employed to deal with the problems of decline in general and visual decay specifically. Reference to several case studies will be made.
DISCOVERING IMAGES: AN EXPERIENTIAL APPROACH TO PARTICIPATION AND EDUCATION IN ENVIRONMENTAL DESIGN

Ellen Kotz
Colorado Springs Center for Community Development and Design

Martie Oury
State University of New York

ABSTRACT

This paper suggests limits and gaps in some of the methods currently used in design research, and suggests some fallacies in the questions this research has asked. The paper critiques the technological mode of research and suggests the need for a feeling mode.

The author outlines some alternative areas of exploration such as the relationship between personal and collective psyche and the meanings of images. Finally, discussion will examine what these suggestions mean in terms of field projects and community participation in these projects.

MULTIATTRIBUTE, MULTIOBJECTIVE DECISION MAKING AND IMPLICATIONS TO AESTHETIC RESEARCH

Fahriye H. Sancar
University of Wisconsin-Madison

ABSTRACT

Research in aesthetics is ultimately aimed at incorporating aesthetic concerns into public decision making. In achieving this end, a multiattribute, multiobjective decision making approach is particularly suitable as it explicitly considers the equity, public value and utilitarian aspects of decisions.

It is assumed that every alternative action resulting in a visual or nonvisual outcome, may have a different value along different dimensions such as efficiency, equity, political acceptability, state stability, or aesthetics. Various techniques can then be used to determine these different values for each dimension and to combine them via suitable weighting and aggregation procedures.

This paper discusses the sequence, the empirical data requirements and the data acquisition techniques in such a decision process for aesthetic evaluation through public consensus. The elements of the decision context jointly determining the overall value or the utility of the outcome are taken to be the purpose of the evaluation, the stakeholders involved, the outcome to be evaluated and the nature of the learning process involved.

It is concluded that setting regulatory standards should be aimed at describing the evaluation process rather than directly enforcing particular outcome attributes. The importance of widespread implementation of this strategy in developing a grounded theory of aesthetics is emphasized.
ENVIRONMENTAL AESTHETICS: EMPIRICAL RESEARCH

Jack L. Nasar

The Ohio State University

SYMPOSIUM SUMMARY

A well designed city-scape or landscape has the potential to evoke a pleasurable reaction from those persons who experience it. Without detracting from the role of a skilled designer in creating such a product, investigators have sought to derive empirically the sources of environmental affect. Ultimately, it is hoped that such information can be used to guide design decisions to produce aesthetically pleasing environments for the public.

Examinations of environmental affect have employed a diversity of stimuli, modes of simulation, measurements of environmental attributes, subjects, measurements of affect and analytic procedures. Such diversity is both damaging and enriching. On the one hand, it makes chaotic the integration of the findings into a meaningful synthesis. On the other hand, where such diversity evolves from the nature of each query or from advances in the field, it provides both valuable results and directions for future endeavors.

While the papers comprising this symposium are (as the previous research) diverse, they share an emphasis on the empirical derivation of sources of environmental affect. The papers differ from one another in a variety of details, but, more importantly, each can be characterized by a central concept which separates it from the others. These concepts include for Chenoweth the choice to derive dimensions of perception from nonverbal measures and multidimensional scaling, for Pardee the choice to consider physically measured features of the riverscape as observed in aerial photographs, for Dickhut the choice to use questionnaires to elicit opinions of various groups about scenic beauty in a river area, for Orland the choice to compare rural and urban residents, for Nasar et al. the the choice to examine prospect and refuge as measured on-site. In each case, evidence of a relationship between the central concept and environmental preference is presented.

With the exception of the use of on-site exposure by Nasar et al., the questionnaires of Dickhut and and paired comparisons by Chenoweth, these studies, share a reliance on slides simulations, on students subjects and on bi-polar adjective scales. While there is evidence that responses to slide simulations reflect responses to the actual scenes, and that student responses reflect those of the general public, nevertheless we can not be certain of the generality of that evidence to the studies at hand. We must consider also the possibility that responses to bi-polar adjective scales may not reflect actual feelings. These problems only suggest certain limitations on the generality of the results.

With that caveat, consider what these studies add to our knowledge of environmental aesthetics. From several of the studies we can infer the importance of context in aesthetic judgement: Specifically, aesthetic response was found related to the type of natural scene viewed -- forest or countryside (Orland), the culture/experience of the respondent (Orland), the characteristics of the observer (Dickhut) and the protection afforded to the observer at the viewpoint (Nasar et al.). Consider the implication of these results for both research and policy. With regard to research, a closer scrutiny of the role of these context variable might be called for. For example, the results of a study for one use or population group might not apply to others. With regard to policy, these results suggest that we might employ universal principles to each situation with care and seek solutions specific to the particular context.

Nevertheless, from the various contexts the results provide additional evidence in support of certain "universal" in aesthetic preference. A preference for open as compared to closed scenes is found in three different situations (Nasar, Pardee, and Orland) in which it was examined. The role of some of the salient aesthetic variables (such as diversity, mystery, contrast and uniqueness) in scenic beauty
are re-affirmed in Pardee's study. An additional evidence in support of adaptation (an urban/rural difference in responding to countryside scenes) is presented (Orland).

In summary, these studies demonstrate some of the breadth in approaches and problem types being considered by research in environmental aesthetics. At the same time, they suggest some directions worthy of further research consideration: Of particular interest is the question of the role played by various contextual factors in influencing aesthetic judgement. Would it not be worthwhile to consider in greater depth how such factors as the characteristics of the viewer, the viewing location and social meaning influence aesthetic judgement?

A MULTIDIMENSIONAL SCALING ANALYSIS OF AESTHETIC PREFERENCES

Richard E. Chenoweth
University of Wisconsin-Madison

ABSTRACT

Aesthetic assessment methodologies, whether they be judgements made by experts or reactions by the lay public, typically employ landscape descriptors which reflect the disciplinary predilections of the investigator. Thus, descriptors can be a priori categorized as artistic (e.g., unity, harmony, etc.) psychological (e.g., mystery, coherence etc.) or physical (e.g., waterfall, rock outcropping). Regardless of the descriptors used or the data reduction methods which may be employed, the problem is the same: The descriptors are forced on the person doing the ratings and may not reflect either the number or type of psychological dimensions which would be used given a free choice. The present study uses a multidimensional scaling technique to uncover the psychological structure employed by untrained publics when making simple preference judgements among pairs of scenes within rural, forested and river landscapes. The number of dimensions comprising the structure and the type of descriptor schemes used by the subjects are reported both within and between each type of landscape.

THE ACCEPTANCE OF AESTHETIC REGULATION AS A FUNCTION OF GROUP TYPE

Kathy Dickhut
University of Wisconsin, Madison

ABSTRACT

Questionnaires were distributed to canoeists and boaters at the access points to the Lower Wisconsin River and were mailed to three other groups -- local officials, landowners and hunters and fishers. The questionnaires assess the places which they felt were of scenic beauty along the river and the attributes which add to or detract from that scenic beauty. Additional questions of particular relevance to each group were included as well. Comparisons of the responses by these different respondent groups and the implications of those results for public policy are discussed.

PREDICTING THE SCENIC BEAUTY OF A RIVER ENVIRONMENT USING LOW LEVEL AERIAL PHOTOGRAPHY

James D. Pardee
University of Wisconsin, Madison

ABSTRACT

The purpose of the study is to create a method whereby planners and decision-makers can assess the scenic quality of riverscapes in a manner which is efficient in terms of both time and money. The study seeks to predict river users' perceptions of the scenic beauty of the lower Wisconsin River landscape using physical elements and compositional indices, as measured on aerial photography. The aerial photography used is 70mm normal color, vertical, in stereo (60 percent end lap), at a scale of one inch equals 2000 feet. Subjects rate the scenic beauty of 35mm color slides taken from the river in a representative (random) fashion. The ratings for each slide are then used to calculate scenic beauty estimates, or SBE's (Daniel & Boster, 1976). Physical elements (e.g., tree, sandbars, and islands) are measured according to number of occurrences, length, area, and/or height, as appropriate, and grouped into three spatial categories.
(primary, secondary and tertiary), and five functional categories (surface, canopy, isolated, screening and enclosing). Using arithmetic formulas, some physical element measurements are converted into six compositional indices: contrast, diversity, enclosure, intrusion, mystery and uniqueness. A multiple regression analysis is then employed using the SBE's as the dependent variable, and both physical elements and compositional indices as independent variables. The result is a linear predictive model of riverscape scenic beauty.

AESTHETIC VALUES IN RURAL COMMUNITIES

Brian Orland
University of Illinois, Champagne Urbanna

ABSTRACT

Starting in the 1960's population and economic growth in rural America is now exceeding metropolitan growth and will increasingly influence the visual amenities of the countryside. The aesthetic values of those affected should be considered in planning decisions.

Using established psychophysical techniques, populations of rural and urban subjects were asked to assess their aesthetic preferences for a variety of natural forest and man-influenced countryside scenes represented by color slides. The results indicate that forest and countryside scenes are judged using different sets of criteria and that direct comparison may not be possible. Further, although forest scenes are rated similarly by rural and urban subjects, there are marked differences in their judgements of countryside scenes that might be attributed to familiarity, congruity and context.

Effective visual management of rural areas must acknowledge differences such as these to best serve the interests of residents and potential rural migrants.
This is in part an attempt to resurrect a theme my students, co-workers, and I have attempted to pursue at previous EDRA meetings: workshops in "Fantasy and Physical Form." As in the past, the focus is on the process of reciprocal interchange between person and environment where fantasy becomes reality through design process and reality becomes fantasy through the process of perception. Although the focus remains the same, the means of examining these issues appears to have changed considerably in the past few years. For one thing, Boyd's work points to the significant impact of the user(s) as central in effecting the interchange between person and environment. For another, Paxson's and my work appears more and more to focus on the creation of form itself rather than an analysis of forms (as has been the case with much of our previous work). Finally, Hecht seems to have become frankly involved with philosophical psychology and its connections to the analysis of environments.

FANTASY BECOMES REALITY THROUGH THE DESIGN PROCESS

Human fantasy appears to operate within polarities which include a number of direct and indirect offshoots of the dichotomy between experiential and inferential modes of knowing, acting, and understanding. There is a tendency to associate the experiential and its various offshoots (the "feminine" modes of impression and expression) with the nonverbal/synthetic side of one's character or of one's creations. Similarly the inferential and indirect tends to be associated with the verbal/analytic (the "masculine") side of one's character and actions. The correctness of this insight is validated and refined by an actual examination of fantasy processes, creative acts, differential uses and philosophical affinities and underpinnings. The four speakers at the symposium follow these four approaches toward a new unpacking of the implications of our analysis of the relation between fantasy and the design process.

As examples of fundamental polarities in fantasy, one could cite as ontological bases of human identity such themes as the Dionysian-Apollonian, Sky-Earth, Fire-Water, or Ancestor-Source. As examples of epistemological themes one could use such dimensions as concrete-abstract, representation-presentation, disjunctive-conjunctive, and outlining-penumbration. The first four of these (the "ontological") are givens of human experience--and in various roles we carve out a position for ourselves on these continua. The second four (the "epistemological") are inferred from the first--and depend on our ability to infer implications of being human. Like the first, these inferential dimensions define the poles within which social role demands and role expectations and role performances take place. What makes for a human performance along these eight fundamental dimensions of fantasy
is the ability to shift, explore, in fact move from position to position along the continua, from role to role and from role enactment to role enactment.

A Person is Not a House

The outputs of the design process—houses, buildings, whatnot—are relatively stationary when compared to their makers and users. They are not known by their potential to take varying positions along fundamental continua so much as by the fact that they are a given realization of that potential—and are an externalization of a given point on a range of continua. If like Paxson and I (1978a; b) we assume that the aesthetic disposition of persons will match the predominant style of some externalized object we give too short a shrift to the relative plasticity of people as against the things they make. As we tend to look at the matter now, people have a kind of "home" on fundamental dimensions of fantasy and personality that relate them in a certain familiar way to the fundamental dimensions of human identity. Yet, they are free to move and explore, in a given role system, the parts or elements of those dimensions not naturally safe and familiar to them (Juhasz, 1983a). The objects they fashion (directly by design, or indirectly through use and wear) can then be looked at as kind of cast-off snake skins variously representing either an experimentation with a given (extreme) position on those continua or their "natural" proclivities. In any case, the objects have a hardness, and non-resiliency of character quite at odds with the plasticity of people (Barker, 1960).

In this sense the externalizations we observe as products of the process of design are not self-expression, in the sense that they directly express the propensities and character of the person designing them. Rather, these objects are expressions of the fantasy of that person at a given point in time. Past work by us, and many others, it seems now to be the case, tended to identify the fantasy and the products of fantasy with the very personality, with the very self of the creative person (Barron, 1969; Corbin, 1977). It is simply not the case that the "house" is an extension of the personal identity of its maker and/or user, as for example Clare Cooper (1974) would have it.

A House is Not a Person

It is a relatively easy matter to explore both the inside and the outside of a house. A house has its secrets, the facade can tell lies about the interior, the lace curtains can hide genteel misery—yet the exploration of the interior is something that can be undertaken with relative ease. Exterior and interior fold into one another. Persons, too, have their interiors—but only the self is privileged to penetrate into that interior—and even that penetration is never complete. Both the depths of secret and the depth of delusion and self delusion, deception and self deception are of a different order of magnitude in persons than in their works (Laing, 1960). The work, then, can be looked upon as a statement—often a rich and pregnant statement—that can be used to make inferences about the interiors of the persons who fashioned it—and to make inferences about the relation between the persona and the self of such persons. In this sense the work of a person is the (guarded) externalization of his or her fantasies—and like a dream, literary work, or other artistic endeavor, open to interpretation (Steele, 1982; Chabot, 1982; Sarbin & Juhasz, 1982). From this perspective the task of the psychologist is hermeneutic—the task of interpreting the work and the person becomes one of writing a convincing enplotment which explains both—similarities, differences, constancies and changes (Sarbin, 1976). This is a dramatically different view of the utility of environmental psychology than is presently fashionable—but one that may be far closer to reality than "scientific" models (Juhasz, 1981a).

One of the challenges each of us faces in this symposium is to differentiate the level of hermeneutic and the type of hermeneutic appropriate to "houses" and persons. The methodology of environmental design research will depend on our ability to find divergent approaches that fit the difference between things and people, and yet which can encompass the degree to which they act as interactive systems (Friedman & Juhasz, 1974; Hecht, Paxson & Juhasz, 1980).

FANTASY, IMAGERY, AND NONVERBAL BEHAVIOR
A significant amount of the background of this symposium relates to the distinction between verbal and nonverbal approaches to apprehending and constructing the environment (Juhasz, 1976a; Hecht & Juhasz, 1983). Considerable research in psychology establishes parallel information processing in humans—where one of the channels of such information processing is aptly called imaginal (Kosslyn, 1980; Klinger, 1981; Shepard & Cooper, 1982). The creative modes associated with imaginal information processing—fantasy and imagery—have been the focus, and remain the focus of our work and the work of this symposium. Yet, it is clear that the traditional emphasis on verbal productivity and conceptual aptness of creative acts serves a purpose and is a valid measure of certain kinds of design productivity. Our past approaches—despite our claims to the contrary—appear to have belittled the importance of verbal processes, the quality of the creative acts they are associated with, and the importance of the interactions between verbal and nonverbal processes in mentation.

In particular, the philosophical work undertaken by Hecht in the past several years, and reported on for the first time in this symposium, is seen as an important step toward evening that score, and the gaining of greater conceptual clarity. If, perhaps, our past efforts have had to do with some righting of the wrong in which imagery and fantasy have been de-based by psychologists and design critics (Juhasz, 1979), the time has come to properly assess the importance of nonverbal processes without any defensiveness vis-à-vis the "secondary process."

To make a long story short, design is, in part, not a "language" as Alexander (1979) would have it, because of what we value in design is a-linguistic and doesn't follow the rules of language (Juhasz, 1981b). When we say that fantasy becomes reality through the design process, it is these nonlinguistic aspects of constructed reality that we point to and attempt to interpret. Yet, it is the paradoxical power of language that becomes the primary tool of interpretation for that which cannot be put into words (Juhasz, 1976b; 1977a). A simplification, not too far from the truth, would have it that while design itself is primarily non-linguistic, hermeneutics of design—design criticism—is primarily linguistic. Both the right and the left hand, the doing and the talking about, are necessary for an understanding of ourselves as actors in the environment (Juhasz, 1983b).

Varieties of Fantasy

Fantasy, in its own turn, is not a unitary process. To say that some process is nonverbal is to identify it—but it is not to say that there are no identifiable varieties of it. The means of construction of non-verbalizable forms, reported on in some detail by Paxson, will help us formulate some guidelines for the differentiation of nonverbal processes utilized in design. Preliminary work suggests that the information processed by the haptic as against the distance—receptor oriented senses may form the basis for differentiation between "sensory-motor" and "imaginal" modes of understanding and expression (Juhasz, 1972).

And what of verbal fantasies? We are only beginning to understand that the figurative uses of language are no more or less primitive than its literal uses.

REALITY BECOMES FANTASY THROUGH THE PROCESS OF PERCEPTION

Boyd focuses on the intergenerational expression and teaching of values by means of the hard discipline of the physical realities of the home. As Bachelard (1964) pointed out oh-so-long ago, we introject our parents through internalizing our house—at least in part. As we said previously, a house is not a person, nor is our parents' house (figuratively or literally) our parents. BUT, quite likely, the house IS the source of the inflexible superego which is an idealization, an inflexible projection, a tyrannical nurturing haven for our fantasies. In this sense the Parents tell us—do, not as we say, but as we do—do as we arrange our house, not as we arrange our lives.

At the first incarnation of this symposium (Juhasz, 1977b) my friend and colleague Don Rothman recounted the story that in his childhood the furniture was moved in the living room twice. Once when his sister was born, and once when his father died. It is in this sense that the rigid, the right, the inflexible order of things is established in our fantasy. The supposed external reality which gives rise to the secondary process through its
unyielding reality principle can as well be seen as the Parent of our most irrational longings and most inflexible rules.

Where Boyd's work is of pioneering significance is in her detailed and empirical study of the way in which values are communicated in the use of space across generations within the same setting. The notion of a "ritualized viewing" of the formal living room space becomes a vehicle not only for understanding of the ordering of fantasy by the constructed environment but also of the "dialects" with which a family establishes its group identity.

Boyd's work, in its own turn, is a model for the close attention, observation, and recognition tasks which define our perceptual interchange with the physical environment. These observational tasks are enriched by disassembly, analogy, and analogical reassembly in what may be called imagination and fantasy properly so called. The perceptual processes are then seen as necessary but not sufficient conditions for their reassembly in fantasy (Sarbin & Juhasz, 1970). A considerable amount of my recent work in the teaching of architecture has focused in the developing of specific exercises in perception and imagination which will help students in the design process. Part of my report in the symposium deals with the description and the application of these tasks in the past two years.

One of the questions consistently raised in the former workshops that precede this symposium has dealt with the question of the perceptual side of parallel information processing. As verbal and nonverbal processes can serve as anchor points in a dichotomy of modes of information processing on the output side, are there similar perceptual pathways that delimit the initial processing of nonverbal and verbal information? Paxson's recent work, as referred to previously, has a bearing on this question—as does much of traditional developmental psychology, although it has not been much used for that purpose. We have always assumed that non-verbalizable forms have a different perceptual hook on the system than verbalizable forms—but systematic investigation of this question remains largely a work of the future.

The important dimension of users' effect on the environment is their actions rather than their perceptions, cognitions, or beliefs. The very nonverbalizability of our "instinctive" use, abuse, neglect, or care of environments emerges out of the framework of actions rather than reflections which define us as users or consumers as against critics of an environment. The departure of this symposium from the former workshop, is clearest in the focus on the creation of meaning-in-action rather than reflection—a way we hope into a clearer analysis of non-verbal/analytic modes of signification.

An existentialist description of space, as proposed by Hecht, has the potential to serve as a theoretical framework for this task. Hecht closely examines what he perceives to be fundamental gaps in predominant structuralist approaches to the description of space as the user experiences it. He proposes that the reality of the phenomena of the user's impact of a setting lies in the centrality of transformational and transitional influences for a knowledge of space-in-action.

The very hardness of objects, their nonplastic character, which establishes them as not-persons in the first place, underlies the significance of a new concern for a proper description of the slow accrual of changes through the hands and feet of users. A renewal of interest in studies of environmental erosion and accretion (Patterson, 1974), of wearing in and wearing out (Soleri, 1973), gains significant new focus through these analyses. The aim is finally to begin to frame a hermeneutics of environmental competence.

References


ABSTRACTS OF SYMPOSIUM PAPERS

An Example of Family Values Reflected in Use of Interior Space

Virginia T. Boyd, U. of Wisconsin-Madison

The Kohlman homestead in Dane County, Wisconsin was the focus of a series of interviews with informants having first and second-hand knowledge of the household. Conducted as part of an historic restoration proposal the information collected centered upon both the furnishings present around the turn of the century and the household members use of the objects and spaces. Interviews revealed a highly idiosyncratic example of the use of a formal space in family life which was followed for several generations. A unique pattern of usage of the conventional formal livingroom, closing it off from usage altogether except for ritualized viewing was maintained over three generations of residents. The process and form of use of this space are explored as they reveal values in use of built space and the influence that this use had upon activities and position of family members. Issues related to restoration and presentation of such spaces are addresses as they question the mode of presentation of such spaces to the tourist or occasional user.

Transformational Settings: An Existential Description of Space

Peter R. Hecht, Illinois State University

The paper presents a description of individual and group experiences of built spaces. Deriving from an existential-phenomenological framework an answer is presented to criticisms from structuralist perspectives on the lack of concern with place as opposed to time. In filling this gap in existential theories reference is made to the concept of change through the activity of the individual vis a vis the physical setting. The transformational and transitional influences of built spaces are considered as the basis for a knowledge in action of space beyond the purview of any set of symbol systems that may be attached to the structure. This notion can be observed in ways of direction finding as well as individual’s use of private and public places. The concept of lack as a fundamental human experience and the problem of the reduction of alternative behaviors are used to describe individual differences in reactions to particular environments. It is suggested that this offers a complementary but not necessarily contradictory point of view of person-environment interactions to structuralist positions. Additional questions are raised about new focii for research in user satisfaction and competence in the environment.

Imagination in Design and Designing Imagination

Joseph B. Juhasz, University of Colorado

Current approaches to the design of the built environment pose a paradoxical dilemma. The line of thought emanating from recent EDRA's pushes for rationalism in the designer’s actions. This rationalism, however, has the unintended side effect of relegating imagery to a neglected and subservient status in design. The arrogance of the designer in regard to the client is replayed in the arrogation of all value to the analytic as opposed to the imaginal. Returning this imbalance to some dynamic equilibrium requires provision of some structured experience for enhancing imagery use in the teaching and practice of design. An increase in the competence of the designer in using imagery will also strengthen the competence of the user as well through the ‘rational’ provision of imaginal experiences in the built environment. Such a process is proposed as a sequence of four exercises. First is the acute observation of the physical environment without knowledge of what features will be called upon for any solutions. Next comes recognition of what was there without being able to go back. Following this comes analogizing from what was recognized to what one is reminded of in the way of socially appropriate associations. Finally, in synthesis what was recognized is brought together with one’s associations to form new patterns for intervention in the setting.
Explorations in Non-Verbal Forms

Lynn Paxson, CUNY Graduate Center

Labyrinths and mazes are historic environments that are typically not describable. The use of such forms and the construction of new forms that are learned through use are the central issues examined in this paper. Current psychological research points to parallel processes and multiple pathways for utilizing information. Explanations for this lie in the lateralization of the brain and differences in functions of the left and right hemispheres. Two identified processes are verbal/logic/analytic thought and non-verbal/imaginal/constructive thought. Labyrinths belong to the latter and the possibility of other shapes that are understood through this process are considered. Processes for deriving non-verbal forms are looked at in relation to forms found in the everyday world. The issue of the seeming transitory nature of non-verbal forms is addressed through the consideration of available shapes and objects that have been found to be non-verbalizable. The use of non-verbal/constructive forms in design and design education are envisioned as a functional marriage of design and psychology that has yet to be consumated.
INTRODUCTION: DEFINING THE THEME

The theme of this symposium is contextual fit and its significance as an aspect of environmental meaning for the full range of design scales—from interior to architectural, to urban as well as landscape. The term contextual fit generally refers to the perceived compatibility between a new physical entity and an existing setting into which it is being inserted. Within the broad framework of this definition, contextual fit can be seen to encompass problems as diverse as: the insertion of a modern interior into a restored 19th century building shell, the siting of a visitors' center in a national park, or even the radical alteration of an urban skyline resulting from a series of new office tower projects.

The Significance of Contextual Fit

Research for Public Policy

Considered at an abstract level, examples such as the ones just mentioned do not properly convey the emotional and political potency that often accompanies them. And yet the fact is that a great number of the public policy battles over environmental issues involve a disagreement over the perceived compatibility between a proposed project and its context.

The daily newspapers, for instance, chronicle the ongoing efforts of various citizens' and neighborhood groups fighting against what they see as unfortunate intrusions that will negatively affect their quality of life. The most serious of these intrusions may be such noxious uses as nuclear reactors and toxic waste dumps, but other less severe intrusions may arouse equally as much ire. Moreover, many such intrusions are objected to on the basis of aesthetic or symbolic criteria. One example, at the urban scale is the new wing of the National Gallery, the subject of a recent article in the magazine, The Washingtonian. The author argues that the insertion of the new wing into the fabric of Pennsylvania Avenue is an act of "elegant vandalism", because its effect is to destroy one of the most heroic vistas in Washington (Duggan, 1983).

Similar examples at the architectural scale also abound. In Greenwich Village, for instance, neighbors were aghast when a traditional 19th century brick townhouse (accidentally destroyed by a Weatherman bomb in 1970) was replaced by a new townhouse that combined traditional brick detailing with a triangular wedge protruding from the facade. Although the Village neighbors remained unconvinced by architectural critics who labeled the new design "a brilliant synthesis of new and old", the scheme was nevertheless approved by local authorities and built as designed (Brolin, 1980).

As these examples vividly illustrate, the issue of contextual fit underlies a wide range of environmental problems that fall within the purview of public policy. As a consequence, it would seem not only appropriate but necessary that this aspect of environmental meaning be subject to thorough investigation through empirical research procedures. More specifically, there are at least three major questions which empirical research can appropriately address:

1) Is there, for any given population, broad consensus as to what constitutes "compatibility" in a particular type of environment, whether it be an urban neighborhood or forested landscape? Or in other words, can broad guidelines or standards of contextual fit be identified?

2) What are the constructs or criteria that people employ when they evaluate compatibility between old and new? For example, do people notice form more than texture in the landscape? Or similarly, do people notice decorative detail more than massing at the building scale?

3) Are there research procedures that can be adapted for use by interested parties in an environmental dispute for the purpose of fostering a mediated and/or consensual solution?
Existing Empirical Research on Contextual Fit

Ironically, though these three questions constitute a direction for empirical research which is equally relevant at the entire range of environmental scales (from interior to landscape), the topic of contextual fit has so far NOT been considered with equal attention by the various specialties within the environmental research discipline. Generally, speaking, the field of landscape assessment has been the most consistently attentive to this issue. This attention is primarily the consequence of the National Environmental Policy Act of 1969 which mandated the incorporation of systematic visual/aesthetic assessment techniques in the management of the natural landscape (Palmer, 1980). Thus, such government agencies as the US Forest Service, the Bureau of Land Management, etc. have funded a variety of research studies, many of which have--either implicitly or explicitly--considered the question of contextual fit.

More recently, environmental planners have begun to consider the issue of contextual fit in relation to the urban landscape. However, unlike the landscape assessment work, this research is neither mandated by federal legislation nor funded through research programs sponsored by federal agencies. Instead studies of contextual fit in the urban realm are typically sponsored by the developer, concerned neighbors, or another of the interested parties in an environmental dispute (Blair, 1980; Stewart, 1980). To date, the intent of these studies seems to be the assessment of the impact a particular development might have on the profile of an urban skyline (Stewart, 1980; Hedman, 1981).

The Need for Contextual Fit Research at the Building Scale

In contrast to the relative abundance of research on landscape assessment and urban visual resources, research on contextual fit at the building scale--both interior and architectural--remains virtually non-existent. This is unfortunate since recent socio-economic trends have so much altered both the quality and quantity of building construction that contextual fit has become an increasingly important aspect of design decision-making at the building scale. Whereas only a few years ago, many older buildings were routinely pulled down to make way for new construction, they are now more frequently being recycled through adaptive use, or combined with new infill projects.

At the architectural scale, in particular, a significant increase over the last several years in the number of designated historical districts further suggests the need for empirical research on the perception of contextual fit. Because new construction in historic districts must typically be approved by design review commissions, architects are more and more likely to find themselves designing projects in which perceived compatibility is a major design criterion.

At the interior scale, adaptive use and the renovation of older buildings pose similar problems for interior designers and architects who are called upon to determine the appropriate level of new and old elements in the same building. In the case of adaptive use, the typical solution has been to insert a fully modernized interior into a carefully renovated shell. This design strategy may need to be evaluated against popular conceptions of compatibility. Similarly, in the case of building restoration, empirical research may help to establish what original design features are important—not simply in the sense of historic significance—but in terms of the visitors' or users' experience of the place.

WHY A SYMPOSIUM?

The preceding introductory remarks have presented three related issues, the implications of which combine to form a rationale for this symposium. First, it has been suggested that the perception of contextual fit underlies a broad range of environmental issues which are within the purview of public policy; and this leads to the conclusion that contextual fit constitutes a significant aspect of environmental meaning which ought to be thoroughly investigated by empirical research at the full range of environmental scales. Secondly, the relatively successful applications of contextual research in the area of landscape assessment, as well as the more recent transference of those research techniques to the urban landscape, indicate that similar applications are likewise possible at the building scale. And finally, the increasingly apparent need for research on contextual fit at the building scale further underscores
the importance of uncovering the themes which are common to contextual fit at the various environmental scales.

The goal of this symposium, therefore, is to establish a holistic approach to the problem of contextual fit. The possibility exists that common themes may emerge in answer to the three previously mentioned research questions. These themes have to do with: 1) the identification of broad guidelines or standards for what constitutes compatibility, 2) the discovery of common criteria or constructs used to evaluate compatibility, and 3) applications of research procedures in the development of a participatory process among architects, planners, citizens, review commissioners, and others.

This symposium has, in fact, been organized in such way that a number of interrelated themes are addressed by one or more of the five presenters. In addition to the themes associated with the three research questions, this symposium considers at least two others. One of the additional themes is a methodological one; researchers are likely to find that similar research techniques—whether in terms of presentation media, response formats, or data analysis—are applicable at the full range of environmental scales. Another important theme is concerned with the relationship between empirical research and the intellectual traditions of the several design disciplines. Since empirical research is a relatively new component of the design professions, several of the authors have found it appropriate to present historical overviews of a particular design profession as a means of establishing the conceptual links between research on contextual fit and the intellectual traditions of that profession.

Contextual Fit in the Landscape: Natural and Urban

Palmer’s presentation sets the tone of this symposium by addressing nearly all the themes which have just been mentioned. His topic, and the primary focus of his research to date, is nominally within the realm of landscape assessment. However, his broad-based analysis of contextual fit clearly highlights aspects of the landscape assessment research that are likely to link up with research efforts at the other environmental scales.

Palmer begins with an historical overview outlining the development of design concepts in landscape architecture in relation to the issue of contextual fit. Examples of such traditional landscape design concepts include: form, line, and convergence. Palmer then relates these concepts to specific examples of their application to the design process and to recent empirical research. For instance, form and line, as well as the concepts of color and texture, constitute a set of criteria used by the Bureau of Land Management for evaluating the impact of inserting change into a given landscape. Recent empirical research (Feimer et al., 1979) however, would suggest that while the concepts are generally valid, their reliability as evaluative criteria is not high.

Another set of concepts that derive from traditional landscape analysis techniques is that of landscape types. Generally speaking, the natural landscape can be described in terms of a typology based on such factors as vegetation and topography. However, an interesting conceptual problem is this: what is the threshold at which one type becomes another type? The answer to this question may in some instances coincide with the issue of contextual fit. For example, a narrow road in a farming area may well be conceived of as essentially rural so long as only one or two vacation homes are sited there. And yet, with the addition of two or three more it may begin to be thought of as a vacation home development. Or perhaps, given different site designs, the threshold of change might be higher.

Although these examples are given as part of Palmer’s historical overview of landscape assessment concepts, it is clear that both examples illustrate one of the major themes of the symposium, that the constructs which are found to be the basis for evaluating contextual fit at one environmental scale may prove to be relevant at another environmental scale. In the first example, the question is this: if form, line, color, and texture are valid criteria for landscape assessment, might they not also be equally valid in evaluating contextual fit in an architectural setting? In the case of the second example, the question is this: can people’s conceptions of the urban landscape be analyzed in terms of typologies and thresholds?

Palmer himself has gone a long way towards answering the second question. The second half of his presentation, in fact, describes a case study in which the research
question was this: at what threshold does development along a village main street destroy its historic character? In order to answer this question, Palmer has applied some of the techniques and methods of his landscape assessment research to this urban setting. This of course, reiterates another important theme of the symposium—that similar research procedures may be applicable at the full range of environmental scales.

Affective Responses to Urban Scenes

Nasar's presentation continues the discussion of contextual fit at the urban scale. Although the research study which he presents was not originally intended to address the issue of contextual fit, some of his findings nevertheless seem pertinent.

The initial question which generated the research is this: what is the relationship between laypeople's affective responses to urban scenes and planners' assessments of the physical properties of those same scenes? In order to study this relationship, 60 lay subjects were each asked to assess one urban environment on the basis of 9 bi-polar adjective scales; and 5 planning professionals were each asked to assess the physical properties of all 60 environments on the basis of 8 bi-polar adjective scales. The analysis then involved correlating the affective dimensions derived from the lay responses with the dimensions of environmental features derived from the professionals' responses.

In discussing the results of this study, Nasar argues that the dimension "order"—one of three environmental dimensions derived from the professional responses—ought to be thought of as a measure of congruence or fittingness, and by extension, an aspect of contextual fit. If this is the case, then correlations of order with the affective dimensions would suggest what impact contextual fit might have on the perceived meanings of urban environments. Two correlations, in particular, seem significant. First, order was found to correlate with the dimension of perceived safety; and second, order also was correlated with 2 of the evaluative scales (repelling-inviting; unattractive-attractive). Thus, one way to interpret the results is to say: urban environments in which buildings are compatibly related to each other are perceived as more attractive and also safer.

The degree to which order and contextual fit are linked is a question which, of course, still remains to be seen. Additional research is required before the relationship can be properly clarified. Nevertheless, Nasar's work still constitutes an initial effort to identify the criteria by which compatibility at the urban scale is evaluated. But even more important, Nasar's study seems to validate the assumption that environments which are construed as having a high degree of contextual fit have a positive, social and symbolic value.

The Perception of Contextual Fit in Architecture

With Groat's presentation, the focus of the symposium shifts to the architectural scale. Her presentation, like Palmer's, consists of two segments. The first traces the somewhat disconnected threads of the existing literature on contextual fit at the architectural scale; the second segment describes the theoretical and methodological details of an ongoing research study on the perception of contextual fit in architecture.

In her review of the thematic antecedents to research on contextual fit at the architectural scale, Groat discusses 6 discrete sets of literature. First she acknowledges the significance of the existing design research literature in landscape assessment and visual resource management in the urban scale. But in addition to these two sources, she also mentions the design research literature on environmental and/or experimental aesthetics. Included in this category are studies (such as Kuller, 1972; Oostendorp & Berlyne, 1978) that have focused primarily on identifying the dimensions of environmental meaning, but nevertheless have tangentially addressed the issue of congruence.

In addition, Groat also cites three important bodies of literature in the architectural press: 1) the rapidly increasing number of design guidelines documents associated with the formation of review commissions in designated historic districts; 2) the literature on "contextualism", which emphasizes the significance the figure-ground relationship between street patterns and building sites (Shane, 1976; Rowe & Koetter, 1978); and 3) the recent anecdotal and/or theoretical arguments offered by practitioners and critics who have attempted to identify
basic design principles for achieving contextual fit (Brolin, 1980; National Trust, 1980; Ray et al., 1980). Important as these sources are for clarifying some of the theoretical issues and design strategies associated with contextual fit, Groat argues that a significant weakness of this architectural literature is that none has yet cited any evidence derived from systematic investigations of observer assessments.

The combination of these several sets of literature has formed the theoretical basis of the ongoing research which Groat describes in the second portion of her presentation. From the design research literature, for example, the question of how or to what extent the perception of "compatibility" might correlate with overall preference has emerged as an important research question; and Groat's research design has been structured so as to address that question. But just as important, Groat's study has equally strong links to the architectural literature on contextual fit. For example, a detailed conceptual model of the various design strategies for relating new architecture to old was generated from a careful literature review of recent architectural publications. This model was then used as a basis for selecting building sites representing the major design strategies to contextual fit.

This variety of theoretical sources has enabled Groat to address two of the previously mentioned research themes. The first theme—the identification of the criteria or constructs by which people evaluate compatibility—is one that other researchers have already touched on; however, Groat's use of the multiple sorting task as a response format (Groat, 1982) enables her to identify not only responsive (affective) criteria, but representational ones as well (Hershberger, 1974). In addition, the research study has addressed a second important theme—the identification of broad guidelines for contextual fit. Because each building being evaluated can be classified in terms of a particular design strategy (a designation which implies a specific treatment of certain physical variables), the results of the study have the potential for suggesting broad-based design guidelines for specific building types or design settings.

In Rockcastle's presentation, the topic of contextual fit is examined in relation to a specific neighborhood in St. Paul, Minnesota (Rockcastle, 1981). What he describes is the process and product of an architectural studio class (at University of Minnesota) in which the semester's assignment was to analyze a traditional residential neighborhood and to design infill buildings for various sites in that neighborhood. As part of the initial analysis of the neighborhood context, a conceptual model was developed as a means of categorizing the specific design features of the existing neighborhood buildings. This model then became the basis for analyzing and generating design concepts for the proposed infill designs.

The themes which underlie Rockcastle's discussion of contextual fit relate to the other symposium presentations in several interesting ways. First, like Groat, Rockcastle has proposed a model or framework for analyzing the design features of buildings in relation to their context. However, whereas Groat's model was applied to a wide range of buildings in various contexts, Rockcastle has applied his proposed model to what is essentially a case study site. Moreover, Rockcastle has used the model not only for analysis but also as part of the design process. Thus he touches on another important theme in this symposium—the potential for using research procedures in a participatory process. Although, in this case the model was used only by design students, further testing of the model might demonstrate its usefulness as a tool in a participatory process.

With Boyd's presentation, the focus of the symposium again shifts to a different environmental scale, this time to interiors. More specifically, Boyd discusses the problem of mixing old and new elements within the interior of an historically significant building. As Boyd points out, this is one situation in which it is essential that the opinion of an expert architectural historian be considered in the design process. However, in some circumstances, when the preservation of certain elements is only marginally important, it may be that public's
perception of compatibility should also be an important consideration. And yet, until now there has not been a mechanism for incorporating both expert opinion and user perceptions in the design process.

Boyd's contribution, then, is to consider the similarities and differences between the research procedures of the architectural historian and the behavioral scientist in relation to the design process. She does this by comparing two models of the design process: one offered by the architectural historian Orin Bullock (1967) and the other a design-process cycle for architectural programming offered by the sociologist John Zeisel (1981). In making this comparison, Boyd begins to suggest important ways in which these two models might be combined so as to assure compatibility between old and new elements in the interior of a historic restoration project.

In addition, Boyd's analysis of the design process for restoration projects also makes important links to Rockcastle's presentation. Both presenters have, in fact, raised the issue of how analytical and/or research techniques might serve to involve user perceptions of architectural compatibility in the design process. The diversity of their topics-- the adaptive restoration of an historic interior vs. the design of architectural infill sites in a St. Paul neighborhood-- only serves to underscore the potential significance of this possibility.

CONTEXTUAL FIT, PUBLIC POLICY, AND THE FUTURE

Taken together, these five presentations underscore the significance of contextual fit as a link between research on environmental meaning and the realm of public policy. Already, a considerable amount of research on contextual fit in the natural landscape has had a significant impact on land management policies. And, in addition, there are indications that similar research at the urban scale-- particularly with respect to skyline profiles-- may soon have an important effect on development and zoning policies. Moreover, though research on contextual fit at the building scale has only just emerged as new research focus, its potential significance for the administration of design review procedures, neighborhood preservation, historic restoration, and adaptive use has been amply demonstrated by three of the presentations in this symposium. The intent of this symposium, then, is to suggest that these several research directions can be strengthened by identifying common themes between them, and more importantly, that the identification of these common themes may in turn suggest significant opportunities for future research.

REFERENCES


This presentation reviews the landscape architecture literature in relation to the topic of contextual fit. A number of traditional landscape design concepts pertinent to contextual fit are identified and discussed in reference to recent landscape assessment research.

In the second portion of the presentation, the results of research on the potential impact on redevelopment on a village main street are discussed. Particular attention is placed on the adaption of landscape assessment methods to an urban landscape context.

AFFECTIVE RESPONSES TO URBAN SCENES: A FIELD STUDY

Professor Jack L. Nasar
Dept. of City and Regional Planning
The Ohio State University

While acknowledging problems of generalizing research findings, this paper presents an empirical study of environmental aesthetics at the urban scale and relates specific findings to the problem of contextual fit. The intent of the study was to examine the relationship between people's in situ affective responses to urban scenes and assessments by designer/planners in situ of properties of the scenes. 60 subjects, one to an environment, assessed their affect (on 9 bipolar adjective scales) in relation to 60 different urban environments; 5 professionals assessed (on 8 bipolar adjective scales) the physical properties of those scenes. From the affective responses, three dimensions—evaluation, arousal, and safety/potency—were obtained. Safety scores were correlated with those describing the order and traffic. Variables describing the evaluative quality of scenes were correlated with those describing the arousing quality of scenes. The discussion will emphasize the relationship of these findings, specifically the dimensions of order and traffic, to the topic of contextual fit.

A STUDY OF THE PERCEPTION OF CONTEXTUAL FIT IN ARCHITECTURE

Professor Linda N. Groat
Department of Architecture
University of Wisconsin-Milwaukee

The first segment of the presentation reviews the full range of literature concerned with contextual fit at the architectural scale. Six discrete sets of literature—including both research studies and architectural theory—are described in detail. More specifically, the architectural literature is used as a source for generating a conceptual model...
of the various design strategies for contextual fit.

The second portion of the presentation describes a pilot study which investigates the perception of contextual fit in architecture. The previously mentioned conceptual model is used as a basis for selecting a set of buildings that are broadly representative of the full range of design strategies for contextual fit. Twenty subjects are asked to evaluate the perceived compatibility of: 1) a site known to them either through direct use or residential proximity, and 2) a set of 24 other settings simulated through color photographs. The intent of the study is to identify: 1) the criteria (continuity of cornice lines vs. abstract massing, for example) by which people typically assess the compatibility between old and new, and 2) examples of specific projects that are generally viewed by the public as being compatible with their surroundings.

ARCHITECTURAL CHARACTER AND COMPOSITION AS A POTENT MEANS FOR CONTEXTUAL FIT

Professor Garth Rockcastle
School of Architecture
University of Minnesota

Since all architecture is bound to a particular context, the recognizable patterns in the individual architectural expressions of a context play an important role in projecting a sense of compatibility or correspondence. Ironically, the development of design processes or theories that facilitate a designer's interest in proposing compatible architectural expressions for such contexts is lacking in our heritage of architectural thought. This paper illustrates a conceptual model devised for the purpose of acquainting designers with the expressive characteristics of a traditional residential neighborhood in St. Paul, Minnesota. In addition, the presentation includes examples of design projects (hypothetical and real) in this neighborhood that have utilized this conceptual model in their design exploration and development. Finally, these design exercises serve as a basis for an analysis of the strengths and weaknesses of the conceptual model and opportunities for related empirical research.

DESIGN PROCESS IN HISTORIC RESTORATION PROJECTS

Professor Virginia T. Boyd
Dept. of Environment, Textiles, & Design
University of Wisconsin-Madison

The process of altering the interior of an existing structure in order to meet current needs and tastes may be described as remodelling, adaptive-use, renovating, or restoring. However, when a structure is identified as having historic significance, the alteration process becomes quite specialized. This presentation will compare a standard design process as outlined by John Zeisel and a design process recommended for structures designated as historically valuable outlined by Orin Bullock. The two authors were selected because both have written references on this topic which are becoming "standards" in their respective fields. In addition, both discuss the contribution of research within the total design process, an issue of current interest within a number of design fields. The comparison is an initial attempt to identify specific criteria which are distinct or unique to the design process applied to structures with historic significance in comparison to the designing of other kinds of projects.
Three circumstances make it particularly timely to consider methods by which environmental design education can address the integration of teaching about environment-behaviour research with the development of practical design skills. Two are internal to the educational debate: the first is an appearance of growing confidence among researchers that the analysis of concept construction can demonstrate the relevance of behavioural research to design education, design practice and design evaluation (Burgess et al, 1982). The second is what may be the beginnings of a move away from pure formalism in design teaching at some of the leading schools. The third, external, economic factor is the continuing pressure for the effective use of resources. There is now in fact a possibility that design-and-behaviour teaching could be squeezed into a corner or even altogether out of architectural education but there is also a possibility that some reconstruction of the syllabus could bring this subject matter back to the very centre of design education.

The academic context of this symposium is a perceived failure of both the design methods school of thought and the participationist approach to fundamentally affect the way information gathering skills are valued in design education (Broadbent, 1979), and the organisational context the commonly experienced separation of theoretical courses, where methods and techniques for the analysis of user requirements are taught, from the design studios, where skills of synthesis are learnt. We have to be concerned with the simultaneous solution of intellectual and organisational problems.

The core of the discussion itself is thus how the experiments which have taken place over, say, the life-time of EDRA, have been implemented within the organisational structures of the schools of architecture concerned. Following on from this is the question for debate, namely which other directions can now also be attempted. The first substantive paper from van Oudenallen will describe key factors in the design of project teaching intended to bridge the applicability gap. The second paper (Jockusch) will concentrate on underlying attitudes towards the objectives of design and show the effects of introducing fundamentally subversive thinking into design projects. The third paper (Cooper Marcus) will consider which humanist values can be explicitly and directly introduced into projects and studios and discuss the contribution behavioural scientists themselves can make to the teaching. The fourth paper (Duffy et al) will report on an experiment in bringing external reality into schools of design by exposing students to potential clients during their academic exercises. The final paper (Symes and Marmot) will discuss an application to design teaching of the case method employed in other professional disciplines: business studies, the law and medicine.

The significance of these innovations is that they have asserted the centrality of understanding human behaviour to students' future design performance. Whether there is also a common image of the type of environment which can be expected to result from such educational strategies is thus a question which may also be raised in the concluding debate.

The Academic Context

The principal question here is the integration of various types of knowledge in the act of design. Two methods have generally been adopted in the past.

Empiricists on the one-hand, have tended to presume that designing is a passive activity, largely a response to, or reflection of, information obtained from the world about us. The implications of this philosophy seem to be that scientific studies should be carried out concerning the needs and attitudes of any population for whom development is to be organised, or of the other populations likely to be affected by the designers' activity, and that the results of these studies should be available before design itself is commenced. A
substitute for undertaking research directly may be to analyse relevant studies already undertaken by others and draw lessons from them equivalent to those which might have been drawn from direct experience. Now this approach to design research has certainly been criticised, especially in an interview with Horst Rittel discussed by Broadbent in the paper quoted above. It seems nevertheless that it is still considered of some value by the contributors to this symposium. Van Oudenallen stresses design students' need for a recognised body of research material with which to work. Jockusch clearly expects students to undertake their own empirical studies as well as to attend lectures on the work of others. Cooper Marcus speaks of students' subjective response to the environment, and Duffy et al consider visits to potential clients' existing workspace an important learning tool. In the method proposed by Symes and Marmot abstracts of research information produced by others are clearly presented as part of the background information to design decisions. One criticism of empiricist methodology is that behavioural research carried out before a design cannot be "turned into" instructions for the synthesis stage, but the information created by empirical methods has clearly not yet been rejected by teachers concerned with human behaviour and design. A definition of its precise value and exact limitations in educational practice is one possible product of this symposium.

Rationalists, on the other hand, are prone to believe that designing is an active mode of behaviour and that design proposals should be considered the expression of mental preconceptions (1). These can at best be pragmatically tested or at worst only socially legitimised by exposure to the world around them. One development of this philosophy sometimes underlies the call for user participation in design. If design proposals result from preconceptions, anyone concerned may hold them and be able to contribute ideas to the design process. If the evaluation (or testing) of alternative design possibilities is also heavily coloured by the preconceptions of those involved in the evaluation, then there is no escaping the implication that users will sooner or later evaluate those designs which are executed in terms of their preconceptions. It is not only humane but also both realistic and desirable to bring users into the design process at as early a stage as possible.

Symposium contributors vary in the degree to which they acknowledge this argument. Cooper Marcus accepts it implicitly in the significance she allocates to uncovering the future designers' own complex of personal beliefs and attitudes. Jockusch expects students to learn it experimentally through the taking on of user roles in class, as do Symes and Marmot in the game-playing orientation of their approach. Duffy and colleagues, on the other hand, although clearly still dealing with this issue when they discuss the "actual objectives" of the "real client", may be skating round the problem of understanding (or misunderstanding) in suggesting that requirements can be more clearly or more carefully expressed. This whole problem area is sometimes conceptualised as one of translating "users' values" and van Oudenallen makes translation processes the heart of his teaching programme. The extent to which users' values can be externalised by real or proxy users, and then internalised by designers or design students is clearly a major question for architectural educators to discuss.

Knowledge and design clearly interact with each other. That neither rationalist nor empiricist modes of relating the one to the other has emerged as the preferred basis of teaching about people in design environments leads to a consideration of the methods by which an interactive approach can be incorporated in design schools. The contributors seem here to have developed quite divergent viewpoints. Jockusch, in his summary, talks of student-user cooperation within project work but elsewhere he has written of teaching with people in mind as requiring a subversive approach. This is also the implication of Cooper Marcus' statement about infiltration: that courses which do not start out by having a place for positive interaction with user-information may be given some unexpected twist which makes it necessary: the introduction of a photograph of existing spaces in use, perhaps, or the presence of an experienced client at a review or the need to present work in a public exhibition. Duffy and colleagues take the opposite approach: they wear their hearts on their sleeves and bring actual users right into the studio at all stages in the teaching programme. The case method developed by Symes and Marmot is nearer the latter than the former, for it encapsulates real-world problem-solving meetings (the
user experience) in the framework of a course which could in some circumstances actually replace the conventional design studio as well as replacing a specialist course of lectures. In this approach some existing knowledge as well as a partly completed design proposal are presented to students but they must positively act upon it for the class to work. Van Oudenallen clearly also expects that more or less objective design information and more or less explicit design preconceptions can be manipulated effectively at one and the same time. Is this too much to expect?

The Organisational Problem

In pursuing their various innovations and experiments speakers in the symposium have not only to establish academic objectives but also to put their ideas into practice within existing organisations. In competing for educational resources, they have had to show how they can both assist in the transfer of knowledge and contribute to the socialisation process which will lead students to be accepted as proper members of their chosen profession (2).

Placing in the course is a crucial issue. Jockusch is discussing the programme of a complete school of architecture. Cooper Marcus can also discuss the experience of a school which for some years considered the humanist orientation central to its whole effort but has since changed its orientation with the consequence that the various innovations concerned fell into particular positions: a compulsory unit early in the programme, an option for later years and one of a number of postgraduate specialisations. Van Oudenallen's programme also has a solid track record. In contrast both Duffy and colleagues and Symes and Marmot have been concerned with reestablishing this orientation as a possible specialisation in schools where explicit treatment had fallen by the wayside, and both groups clearly consider their efforts could be usefully spread further into the main sections of their courses. The criteria by which educational intentions are judged and resources allocated by the host organisation may be very much harsher when dealing with innovation at the periphery than when dealing with modification of the core. Schools hoping to expand may likewise be less demanding than those under pressure to contract.

Allocation of time is one reflection of these structural conditions. It is especially critical for innovations which require taking students out of the normal timetable adopted by other components of their courses for then any innovation is likely to be criticised as disruptive. Exposure to the pace of life outside the academy as attempted by Duffy et al is always going to create conflicts with the life within. Real users and actual clients can work both more quickly and much more slowly than students on their own: the Cooper Marcus experiments probably show signs of both types of misfit. Both van Oudenallen and Symes and Marmot can avoid these problems by accepting the discipline of established academic timetables. Jockusch may be able to avoid them by reorganising the academic framework itself.

Allocation of space can also become problematic if the educational method involves either working with large groups of people within the walls of the School or taking teaching outside into the city or landscape itself. Van Oudenallen's adaptation of conventional studio teaching is perhaps the least problematic approach from this viewpoint. The case method of Symes and Marmot seems vulnerable to the difficulty of a whole class holding the designer's pencil at one time. Even in business or law schools special classrooms are created for this kind of teaching. At the other extreme both Cooper Marcus and Duffy and colleagues find it useful to take students many miles away from their academic base and must arrange access both to and into the preferred environments. Jockusch has at least one example of using a part of the University itself as an alien environment but this, while opportunistic in avoiding the use of others' resources may also widen the scope for intra-organisational conflict.

Tutorial assistance may seem straightforward since in most examples discussed in the symposium, the teachers have themselves initiated the programme concerned and been able to give freely of the necessary time and effort. In Duffy's case however, and quite possibly also in some of those covered by Cooper Marcus and Jockusch, clients and others are being asked to act in quasi-tutorial roles for which they may be neither qualified nor given any reward. Van Oudenallen relies on teachers familiar with the interpretation of research results. Symes and Marmot will make a
special point of the need to train teachers in new methods and this, an additional call on resources for the host organisation, may be something which should apply to all the innovations discussed in the symposium.

Assessment and evaluation are an integral part of most educational programmes. What problems are raised by the attempt to assess students' work in an innovatory class? To what extent can the set of these assessments be taken as a measure for evaluating the innovation itself? Jockusch and van Oudewater both discuss eight years' experience with this issue, Cooper has considerably more and both Duffy and Symes rather less, but all contributors have been working in different organisational environments. The traditional method of standardising educational performance is the exchange of teachers: can this often expensive procedure be partially or even completely replaced by the exchange of teaching materials? Perhaps the symposium itself, an exchange of experience on common ground, will be seen by most organisations as adding usefully to a process of producing more norms, but should it be assumed that some norms are desirable?

Intended Outcomes

It was stated in the first paragraph of this summary that there was a possibility that design-and-behaviour teaching could return to the centre of architectural education. Clearly in some schools it never was at the centre and in others it has never departed. The definition of design-and-behaviour teaching is also in question: some prefer to call it the humane or humanistic approach, others talk of a specific professional rollout-briefing - or of a general attitude "with people in mind".

Leaving aside details of these two questions in the expectation that they will emerge in the symposium, the general question remains: should this facet of architectural knowledge be given a prime place in any professional programme? Clearly the contributors take a range of positions on this issue. One question which divides architectural educators is whether the purpose of this type of teaching is to improve the future architect as a person or to improve the architecture he or she produces. Those who take the latter view or argue that one cannot be achieved without the other, may also be asked to show by example designs in which "improvement" has already occurred or examples of where "failure" is clear. Do each contributor's examples have something in common with those of the other contributors? Is there in fact an architecture-with-people-in-mind which exists to be taught? Or an architecture-with-people-out-of-mind which, by default, will be learnt? The answers to such questions are clearly beyond the province of this symposium, but they may nevertheless be present in contributors' minds and underly the general thrust of their arguments.

Footnotes

1. The term rationalist is used here in its philosophical sense, which posits the mind as the primary source of knowledge, and is not intended to refer to recently developed positions in architectural theory which use the same term.

2. This at least is the assumption that I make, since all contributors are speaking of their experience with courses which have been adopted in full recognised or accredited schools of architecture. There is of course also a case to be made about the contributions which can be made to the general education of any member of society in the arts of environmental design but this is not the intended focus of this particular symposium.

References


ABSTRACTS

TRANSLATING RESEARCH INTO DESIGN IN THE STUDIO SETTING

Harry van Oudenallen

School of Architecture and Urban Planning
University of Wisconsin - Milwaukee

This paper will argue that the choice of building type will greatly affect the quality of an environment-behaviour design studio. The goals of these studios are to:

1. Make the student sensitive to the human condition.
2. Knowledgeable about the research and information available about special groups.
3. Teach them to synthesise this information and reflect this in architectural design.

The choice of building type will be shown to affect one's facility to integrate the methods and techniques for analysis with those synthesis skills to be learnt in the studio setting. Student work at UWM-SARUP will be used as examples of appropriate problem types. These problem types share certain characteristics which are indispensable to an EBS studio.

Summarised they are

1. The building type has a substantial body of behaviourally based research literature concerning the users.
2. The information requires translation and organisation responding to the particular problem.
3. The site is topographically and geometrically complex, thereby not lending itself to overlays of bubble diagrams and adjacency diagrams.
4. The site has a contextually rich identity so as to narrow the form responses the design may take, this allows design to focus on the EDS issues.

It is the belief that if the above characteristics become part of the criteria for choosing the studio vehicles, then the formation of socio-spatial concept construction can take place more rapidly and thereby more directly show the relevance of behaviourally based research to design.

THE TEACHING OF ARCHITECTURE WITH PEOPLE IN MIND - SOME ASPECTS OF STUDENT-USER-COOPERATION WITHIN PROJECT ORIENTED STUDIES

Peter Jockusch

Fachbereich Architektur
Gesamthochschule Kassel

This paper will give some experience from eight years of attempt to sensitise students to user problems. This will be summarized under seven headings.

First the students' commitment to architecture with people in mind starts with self-experience, mainly the residential experience from childhood and adolescence.

The second lesson to be learnt may be to discover the immediate students' environment, i.e. social situations where the students take everyday roles as users or where they analyse the behaviour of people whom they personally know well.

Thirdly students assess the users' experience and behaviour in social and environmental situations with which the students personally are not familiar (activity patterns, time budgets, space and equipment needs as well as organisational and social characteristics of special domains of human activities). This includes psycho-social criteria as well and may lead from a status analysis via a criticism of social and environmental situations to needs for change and to action concepts for planning and realisation of such changes.

The fourth lesson may be to analyse and to understand the social, socio-economic, environmental and ecological context of a certain problem. Such context studies analyse built form, land use, main activities, vegetation, climate, topography, soil conditions etc. for the physical context, public administration, legal basis, budgetary situation, decision making structure, political issues concerning planning matters etc. for the socio-economical side.
The fifth lesson to be learnt may be history, not in the sense of teaching architectural historic styles but more civilization history, social history, and not in an encyclopaedic way but problem-focussed to understand the life history of existing facilities, social and political developments that brought about the planning decisions of earlier times, architectural and social ideological concepts, changing tasks and roles of people in civilization and social history etc.

The sixth domain comprises the legal basis, norms and standards where, besides a profound knowledge of content and operational modes of laws, regulations, norms and standards, a critical distance towards them seems as vital as an analysis of the impact on users and on design constraints.

Examples are given where students only could find problem solutions by by-passing norms, standards and regulations.

The seventh lesson to be learnt is social learning, successful studies comprise the development of a culture of conviviality and team spirit so that project work can be pursued in a partisan, even subversive attitude so that the future architect develops social qualities of a participation minded socially engaged advocate, an altruist facilitator with a practical sense and the ability to serve and to guide.

References

Jockusch, P. Project-Oriented Studies. Keynote address to the international forum on "The Role of the Project in Design Education" held by the EAAE (European Association for Architectural Education) at Berlin, 8-10 November 1979. In EAAE Report, Technische Universität Berlin, 1980, pp37-50.


AWAKENING THE HUMAN MAN AND WOMAN: TECHNIQUES FOR RAISING THE CONSCIOUSNESS OF DESIGN STUDENTS REGARDING PERSONAL ENVIRONMENTAL VALUES AND BIASES

Clare Cooper Marcus

College of Environmental Design
University of California - Berkeley

This paper will discuss various methods for assisting student to uncover their own values and to see how these may affect the way they design. The methods covered will include the Environmental Autobiography approach and will be illustrated with work done by students on this course. The paper will also discuss how similar exercises can be infiltrated into other courses. The element which is missing in most schools of architecture is a credence in subjective personal responses to the environment and the question to be answered is how these responses can be exploited in courses which give almost exclusive emphasis to the objective world. Many schools have gone through a period of scientism in which intuition has been considered unjustified but the designer who is to be seen as a whole person must integrate both types of knowledge.

CLIENTS IN THE STUDIO

Frank Duffy
Petter Eley
John Worthington

School of Interior Design
University of Cincinnati

During the last two years partners and associated from the British interior design and space planning firm of Duffy Eley Giffone Worthington, London, have been appointed as assistant professors in the School of Interior Design at the University of Cincinnati. Teaching studio courses and lectures have been undertaken by groups of senior personnel from DEGW who unlike a traditional architects' office have a great deal of professional experience in working with different clients of commercial organisations in Europe, understanding their changing requirements for space in connection with space in buildings, and the taking of specific projects through to the production and supervision stages, run from the London office.
A 'real' studio project was set for a class of about 12 interior design and architectural students for a 9 week semester, who had to both understand a client's office requirements and plan him into a suitable building. Choice was given typically from four local firms and four different building plan types.

Existing offices were visited, and a director from each organisation was interviewed, who also came to group discussions and the final 'jury' on the project. The perception of clients' roles was not always clear, and some interesting misunderstandings arose. All experience of these contacts were very worthwhile leading to a deeper understanding of the problem/solution of designing office space. The client had the chance to become a member of the design team, which brought rewards of a design concept thoroughly grounded on actual requirements.

Society needs better buildings, these can only be produced where the client and designer have to learn about each others' motivations and processes. The client needs to learn how careful design objectives can improve the efficiency of his organisation; designers gain by inventing an end product which is strong enough to stand up to changing requirements and the changeable management in the future of the facilities provided in a design.

ARCHITECTURAL CASE PROBLEMS: CAN ACTIVE LEARNING METHODS BRIDGE THE GAP BETWEEN THEORY AND PRACTICE?

Martin Symes
Alexi Marmot

Bartlett School of Architecture and Planning
Univeristy College London

The paper will discuss the development of a course of case problems showing architectural design in its social context. The aim of the course is to bridge the gap between theoretical writing on the social aspects of design and the practical experience of working on real world design problems. The teaching approach is an adaptation of the case method used widely in other professional subjects: law, medicine and business studies. Partly developed design solutions are presented to the students together with information on relevant research findings and on the roles and preconceptions of participants in the design process and an outline of the constraints they face. The students then make their own decisions on appropriate design strategies from this point on. In class, the variety of their solutions are discussed and reference is made to theoretical literature illustrated by the case.

Issues raised in the preparation of teaching material include both the general lack of information about the design process and the difficulty of tailoring examples drawn from the real world to the stages in students' developing patterns of knowledge. Issues raised by teaching the course itself include the difficulties which designers experience of working at great speed on non-ideal solutions and the impact of students' age and experience on their understanding of the issues involved.
VERNACULAR ARCHITECTURE: THEORETICAL ISSUES

Christos A. Saccopoulos
Department of Architecture
Iowa State University

Mit Mitropoulos
C.A.V.S.
Massachusetts Institute of Technology

SUMMARY OF SYMPOSIUM

The first of two related symposia on vernacular architecture, focuses on theoretical issues. (In the second one field research is presented.) In the four papers briefly described below, the authors address such questions as "What does the term 'vernacular architecture' include?", "How do we view and interpret the process and the product?", and "What are the lessons that can be imparted to high-style architects?"

The relationship between vernacular and high-style architecture underlies the concerns of all four authors.

In The Interpretation of Vernacular Architecture, Lawrence investigates the range of approaches employed to understand vernacular architecture. His discussion includes, among others, aesthetic, technological, social and cultural explanations. He concludes that no general theory exists for the study of vernacular buildings and advocates a structuralist approach to provide a comprehensive methodology.

Newton in Vernacular Revivals examines the influence of vernacular design processes on high-style architectural movements. Post-modernism, in its revival/eclectic/mannerist aspect, is paralleled to similar movements of the second half of the 19th century; the author shows that past and present revivalist architects apply design processes akin to those employed by the vernacular builders.

The distinct characters of popular and folk cultures are defined in Riley's paper On Users, Symbols and Varieties of "Vernacular". The author places doubts on the notion that all architecture not produced by design professionals is truly vernacular and questions the assumption that valid lessons about symbol systems can be learned equally well from popular culture and primitive, or folk, culture. The author further questions the role of the architect as an interpreter of shared symbolism and suggests that individual expression is more appropriate for design professionals.

Vernacular architecture is seen as a means of implicit communication in Saile's paper, Ritual, Custom and the Vernacular. Ritual, as a means of formalizing, and custom, as a means of reiterating shared beliefs and assumptions, are discussed vis-a-vis the indigenous architecture of the southwest.

The symposium sets the framework for discussion about definitions (Riley) meaning (Lawrence and Saile) and applications (Newton).

Lawrence provides a background for the discussion by establishing the viewpoints from which vernacular architecture can be explained. Newton and Riley set up a dialogue: Newton discusses the lessons certain architectural movements carry from the vernacular while Riley challenges the assumption that all such lessons are equally useful and that high-style architecture should aspire to expressions of collective symbolism.

Saile elaborates on some of the issues of meaning brought up in Lawrence's The Interpretation of Vernacular Architecture by showing how, through ritual and custom, vernacular architecture becomes a communicator of shared, unspoken beliefs. Saile also points out, as does Newton, the fact that process, and not product alone, are of interest in the study of vernacular architecture.

The use of a specific regional indigenous architecture in Saile's Ritual, Custom and the Vernacular to illustrate arguments facilitates the transition to the second related symposium on vernacular architecture, titled Field Research.
THE INTERPRETATION OF VERNACULAR ARCHITECTURE

Roderick J. Lawrence

Département d'Architecture
École Polytechnique Fédérale de Lausanne

ABSTRACT

There are diverse interpretations of vernacular architecture: architects, ethnologists, historians, geographers, social anthropologists, sociologists, psychologists, and others have employed specific approaches for the study of the built environment. Underlying the approach and methodology of much research is a vast range of ideas and assumptions, stemming from schools of thought widely accepted as creditable during the 19th and 20th centuries. For example, diffusionism has been used to explain the construction of vernacular buildings by different social classes or in diverse geographical regions. Similarly, an evolutionary theory or, more recently, a socio-cultural interpretation has been used in studies of vernacular architecture. This paper discusses a range of complementary (sometimes contradictory) approaches commonly used during the last hundred years and the insights and problems they raise. It focuses upon explanations of the following kinds:

1) the aesthetic/formalist approach
2) the typological approach
3) evolutionary theory
4) diffusionism: social and geographical
5) physical explanations: building technology, materials, site and climate
6) social explanations: defense, economy and household structure
7) socio-cultural factors: religious practices and collective images.

These diverse interpretations are compared in this paper. It becomes apparent that there is no general theory or comprehensive approach and it is briefly illustrated with reference to a previously published study.

VERNACULAR REVIVALS

Barry Newton

School of Architecture and Urban Design
University of Kansas

ABSTRACT

Most enquiries in architectural scholarship are fueled by an implicit or even explicit presumption that the study will result in some benefit to current architectural practice. On many occasions, revivalist tendencies have focused on vernacular architecture and as a result of this uneven attention our definition of the vernacular has shifted. This focus has frequently been in response to a wave of eclecticism, and the current pre-occupation is similar.

With the demise of modernism, and the growth of mannerist-design the study of the vernacular asks important questions not of architecture as object, but of architecture as process.

The processes of vernacular design make distinct assumptions about important matters of use and production.

The paper proceeds as follows: The results of the romantic critique of industrialism are examined. The major revivalist tendencies during the second half of the 19th century are summarized. The qualitative distinctions of the Arts and Crafts Movement are examined; their insistence on the process of making as a dominant force in design is elaborated by an examination of their vernacular source material. The issue of division of labor and creative skill are explored. The works of Morris, Lethaby and Webb are used to illustrate these procedures.

In the discussion of Lethaby's educational doctrines, his tenure at the Central School is examined and an attempt is made to relate his teaching philosophy to the re-creation of a vernacular method of building.

The paper concludes by offering a series of parallel arguments to those used by Morris, et al. in their criticisms of Gothic revival, to illuminate our understanding of post-modernist design, both in its successes and its more obvious deficiencies.
ON USERS, SYMBOLS AND VARIETIES OF "VERNACULAR"

Robert Riley

Department of Landscape Architecture
University of Illinois at Urbana-
Champaign

ABSTRACT

The term vernacular has evolved from its early definition as "the native or indigenous language of a country or a district," until it now means practically all common building or landscape types not historically the province of the traditional design professions. Judged by its currency this is a useable definition; its usefulness is a different matter.

As the meaning of vernacular has broadened, its uses have proliferated. Designers have found in it a source of formal vocabulary for new work, a visual inspiration at a more abstract level, and a philosophical justification for stylistic innovation. More recently, designers have sought in the vernacular knowledge about how people interact with the environment: what satisfactions people seek and how they achieve those satisfactions. Designers hope that the supposedly simpler, more direct processes involved in vernacular design will provide lessons useful in our own time, culture and profession.

That hope, however, rests upon a number of assumptions that are seldom examined and often naive. Particularly questionable is the recurring complex of assumptions that include the following: all non high-style traditions can implicitly be lumped together; popular culture is closer to primitive or folk culture than to elite; and the lessons about symbol systems drawn from any one non-elite culture are valid for all. This set of assumptions is the basis for the fashionable notion that the designer's job is to cleverly interpret obvious, shared symbols already existing in popular culture.

Even the most superficial examination of the relation among user, symbol, and culture across the variety of settings commonly lumped as vernacular shows that notion to be simplistic, and suggests that the more feasible role for the contemporary designer is that of provid-

RITUAL, CUSTOM AND THE VERNACULAR

David G. Saile

School of Architecture and Urban Design
University of Kansas

ABSTRACT

A discussion of vernacular architecture and spatial organization as implicit forms of communication is presented in this paper. Most people, most of the time, know architecture implicitly, that is, through shared unspoken beliefs and assumptions. In ritual, some of that knowledge is formalized and made explicit in objects, space, and prescribed speech and behavior. Through custom, that knowledge is reiterated implicitly in everyday artifacts, spaces, language and activities.

The processes of construction of vernacular architecture may also be considered an implicit form of communication. They also are related to custom and to ritual knowledge. The discussion primarily uses evidence from studies of indigenous architectures of the Southwest, but attempts to clarify implications for the study and design of environments in our own cultural contexts.
SUMMARY OF SYMPOSIUM

The second of two related symposia on vernacular architecture focuses on field research. Whereas in the first symposium theoretical issues are examined, with reference to specific examples only as needed to illustrate a point, in this second symposium specific field findings are reported and analysed with respect to theoretical frameworks.

Vernacular spaces and forms and their relationships to the cultures that produced them are the underlying concerns of the four papers presented under the aegis of this symposium.

In The Codification of the Residential Entrance in Rural Quebec, Amiel reports on a study dealing with the culture of place. The exterior frontal space of houses located in one of Quebec's Eastern Townships is studied and analysed to reveal the cultural themes underlying the shaping of place, the behaving in place and the meaning of place.

Change of form in response to cultural forces is the theme of the paper by Hardie, Continuity and Change in the Tswana's Expressive Space. The author examines the physical response of the Tswana's settlements when their culture underwent changes as a result of British colonization, increasing population and other related forces.

Mitropoulos in Space and Communication in the Cyclades Islands, investigates two aspects of communication in the Cyclades: interpersonal exchanges that have resulted, over time, in a wealth of semi-private/public spaces to facilitate them; and, more recently, telecommunication networks that have brought about changes in the inhabitants' lifestyles.

In Learning from Anthemius and Isidorus: High-Style Influences on Roadside Monuments, Saccopoulos reports on the cultural significance of miniature chapels constructed by anonymous craftsmen on the sides of highways in Greece, primarily as memorials to car accident victims. An examination of the stylistic sources for these monuments reveals their Byzantine antecedents and shows that, under some circumstances, lay builders look upon high-style architecture for inspiration, reversing the roles that are usually assumed.

Culture and Architecture is the general theme underlying the four papers presented in this symposium. Amiel addresses the issue directly through the analysis of the culture of place. Hardie and Mitropoulos introduce change from two different perspectives: the effects of cultural change on the physical environment are examined by Hardie, while Mitropoulos discusses the effects of physical/technological changes on culture. Saccopoulos investigates the cultural significance of a built form that emerged with the widespread use of the automobile.

By bringing forth the fact that high-style architecture can influence vernacular building, Saccopoulos questions the underlying implicit assumption of the first symposium, (Vernacular Architecture: Theoretical Issues) that in the dialogue between vernacular and high-style architecture the former teaches and the latter learns.
ledge that people use to interpret experience and generate social behavior" (J.P. Spradley)... and place conceived as the complex of human and physical traits distinguishing the "here" from the "there" (A. Rapoport).

In this case, the place is the exterior frontal space of houses studied in three separate socio-cultural and environmental milieux: village center, village periphery and hill country of one of Quebec's Eastern Townships.

The study follows the ethnoscientific paradigm of ethnographic interviews and analysis: identification of relevant cognitive domains followed by their taxonomic and componential analysis to reveal the cultural themes underlying the shaping of place, the behaving in place and the meaning of place.

This study links up with the theme of the symposium in the clarifications it brings to the definition of vernacular architecture in terms of the relative weight of human vs physical traits used in place definition, in terms of the experienced dialectic between human and physical traits used in place establishment and finally in terms of the relative unself-conscious, occupant initiated participation in place making.

CONTINUITY AND CHANGE IN THE TSWANA'S EXPRESSIVE SPACE

Graeme J. Hardie

Council for Scientific and Industrial Research
National Institute for Personnel Research

ABSTRACT

Culture is dynamic and responds continuously to new influences while maintaining core elements which distinguish one culture from another. Architecture, viewed as a physical expression of a culture, would similarly reflect the cultural continuities and changes.

This paper will review Tsawana house and settlement form from this perspective. It will reflect on the changes and investigate the continuities, looking at such issues as how the settlements were planned; how they expanded; what brought major settlement changes; the innovations in house form; and the house and settlement in the context of the Tsawana's world view.

The Tsawana's settlements in the Southern Bantu cultural context are noted from their earliest recordings for two unique features. Firstly, they lived in large settlements with populations ranging from 5,000 to 10,000 people (larger in some places). This contrasts directly with the usual dispersed pattern of settlement. Secondly, the settlements were often relocated. This could come about as the result of the appointment of a new head of state, for it was normal upon assuming office for a leader to move to a new location. Drought or disputes with neighbors also initiated relocation.

Some of the features of the settlement expression which were important in the past are the following:

When a town was relocated, several rituals were observed to ensure that the town maintained accord with the ancestors, thus securing good fortune for the settlement. Once the head of state had located his household, all sections of the state, or wards within the state, would take their location, and likewise the households within each ward would follow a strict order according to their social status. This ordering also reflected the political opposition which existed between the head of state and other royals, who could be potential replacements for the head. The physical expression of the social hierarchy was reaffirmed at each initiation ceremony. The initiates' camp followed the same locational format as used in the town, with the royal initiates in the centre and the rest placed in order of precedence.

Seasonal rituals were undertaken to protect the boundaries of the settlement. Other precautions were also observed to maintain "cool" or ordered conditions within the town. For instance, major disputes were debated outside of the town. Likewise, people who were considered to be potentially dangerous, such as widows or initiates, were removed from the town until they were no longer considered potentially polluting.

More recently, the settlement has changed because of new circumstances. For instance, since the British colonisation of Botswana the various Tsawana states have become stationary. This has brought about many changes in the settlement pattern because allowances have to be made for new
heads of state as well as an increasing population. New heads have taken occupation of areas away from the centre, with their followers in tow. To remain in the centre, on the same site as the former head would be potentially dangerous as it would place the incumbent in close contact with rivals, brothers, and step-brothers. When the royal wards become congested it is normal to move the whole ward to the edge of the town. However, the wards of commoners, whose status depends on geographical location, have started a new section of their ward elsewhere while maintaining their original base and its status. For them, their location in the town, rather than kinship, is the deciding factor in their social status.

Seasonal protection of the town is no longer practiced. However, individual household protection from potentially malevolent influences continues.

These few examples, which are elaborated in the paper, show how both in the past and the present the Tswana's settlement offers an interesting case study of the way in which the physical environment adapts to changes, over time, in the cultural expression.

SPACE AND COMMUNICATION IN THE CYCLADES ISLANDS
Mit Mitropoulos
C.A.V.S.
Massachusetts Institute of Technology

ABSTRACT
There are two reasons why the Cyclades Islands can be an interesting setting to observers of human behavior, specifically of the activity of interpersonal communication. One reason is the anonymous architecture of the settlements, as a form of traditional Mediterranean culture, where spaces-for-communication are articulated to facilitate communication, within ten different types of semi-private/public spaces. The second is the telecommunication networks (for information and 2-way interaction) being superimposed on those settlements. These, together with recent connecting roads, alter lifestyles in directions and with intensity not always desired.

Communications planning solutions to development programs, such as the University of the Aegean, could indicate need to re-examine architecture within its definition as 'Organization of space for movement-through-space, and communications.'

LEARNING FROM ANTHEMIUS AND ISIDORUS: HIGH-STYLE INFLUENCES ON ROADSIDE MONUMENTS
Christos A. Saccopoulos
Department of Architecture
Iowa State University

ABSTRACT
Vernacular buildings are usually viewed as inventions mothered by necessity. As architects we admire the lay builders for their economic use of materials, for their responsive attitude toward the forces of nature, for their development of appropriate forms. We look upon the trulli of Italy, upon the compounds of Cameroon, upon the yurts of Mongolia as examples of highly refined solutions, shaped over numerous generations, through processes of trial and error, iteration and inventiveness, imitation and adaptation. We look upon these vernacular forms as sources of time-tested answers, as paths leading to understanding of cause and effect in design, as lights of inspiration for our particular problem at hand.

When solutions are not dictated by harsh economies, by scarcity of materials or by demanding terrains, however, where do the lay builders turn for inspiration? Why, to high-style architecture, of course! As Rapoport has pointed out in House Form and Culture, vernacular architecture is not just the spring for a one-way flow of ideas. Rather, a relationship of mutual admiration, stimulation and influence exists between it and high-style.

The point is aptly illustrated by the multitude of roadside monuments that dot the sides of the narrow, winding, cliff-hugging highways of Greece. Serving mostly as memorials to victims of car accidents, these vernacular constructs are miniature chapels, usually no more than ten cubic feet in volume, inspired primarily by the traditional basilican and domical churches of Byzantine archi-
tecture. They are commissioned by the families of the victims and built by anonymous craftsmen. The erection of monuments on the site that death occurred is a practice dating to Greek antiquity. Although not buildings as such, the roadside monuments are, nevertheless, models of buildings. Their forms, resulting after the elimination of the pragmatic constraints that shape vernacular buildings, are indicative of what lay builders admire and aspire to when necessity no longer mothers their inventions.
Today's government design and planning professionals are constantly seeking ways to utilize and implement environmental research and technologies in an effort to enhance the programming, design, and planning process and subsequently, improve the product. The need for increased efficiency and productivity requires an urgent creativity and responsiveness. Increased emphasis is placed on identification of, and responsiveness to, user/program requirements; utilizing available information and data processing systems; integrating research data and methodologies into the programming and design decision-making process. Current issues and topics include urban/community design evaluation, user responsive environments, environmental data assessment, alternative energies, materials, technologies, productivity in the work environment, project data programming and management.

The format of the workshop will be that of an informal seminar exchange. Each of the participants will represent an attitudinal approach reflecting his or her field of work, (i.e., architecture, landscape architecture, community planning). There will be a heavy use of graphics to present work examples for purposes of information and discussion.

The workshop will include presentations with discussion, illustrating design and research endeavors, needs and future directions. We are working towards the development of a communication network for the exchange of information, ideas and innovative problem solving methodology in order to (a) enhance communication with the research community, and (b) increase awareness of government programs and interface.
THE GENDER GAP: DOES IT EXIST IN ENVIRONMENTAL DESIGN AND RESEARCH?

The format and intent of this special event has been to invite a select panel of women participants representing a variety of environmental design related disciplines, and have them discuss their perceptions of how males' and females' interactions with the environment (both social and physical) and with the fields of Environmental Design and Research differ. Some issues considered germane to the discussion are: Do men and women contribute differently to the making of environments? What scale and components of the environment most crucially affect women's lives? Do women in design face different career-related barriers than do women in research? Is it true that females tend to be advocates for the 'underdog' more than males?

There are three major categories of participants in the discussion: a moderator - Anne Campbell; five presenters - Doris Cole, Clare Cooper Marcus, Laurie Mutchnik Maurer, Susan Saegert and Leslie Kanes Weisman; and two reactors - Anne Parkhurst and Rebecca L. Peterson. The session will consist of three segments: A brief statement approximately 10 minutes by each presenter, using the above issues as a point of departure, followed by a 30 minute period for comments by and discussion with the reactors, and concluding with a general question and answer period open to the entire audience.

The participants have widely varying backgrounds as may be seen from the brief biographical summaries that follow:

ANNE CAMPBELL earned her E.D. from the University of Nebraska-Lincoln in Educational Administration. Her career has included a wide range of titles: Director of Professional Services and Lobbyist-Nebraska State Education Association; Director of Public Affairs - University of Nebraska; and Commissioner of Education - Nebraska Department of Education. She has served as an advisor to various state and national organizations such as the National Advisory Council for Women's Educational Programs, the Nebraska Coordinating Council for the Handicapped and the World Book Encyclopedia. Recently, she was honored with the Roscoe Shields Award for Distinguished Service to Arts Education.

DORIS COLE received the Master of Architecture from Harvard University Graduate School of Design and is a registered Architect. She has practiced architecture in Cambridge, Massachusetts since 1965 and is presently a principal in the firm of Cole & Goyette. She has been a guest lecturer at various educational institutions, including the Massachusetts Institute of Technology, the Institute of Contemporary Art, and the Rhode Island School of Design. She is the author of two books concerning women in environmental design: From Tipi to Skyscraper: A History of Women in Architecture (1973), and Eleanor Raymond, Architect, (1981).

CLARE COOPER MARCUS was trained in Britain as a geographer and worked in various countries as a planner. After emigrating to the United States, she completed graduate degrees in Urban Geography at the University of Nebraska and City Planning at the University of California. She has taught at Berkeley since 1969, holding a joint appointment between architecture and landscape architecture. Her courses include: Social and Psychological Factors in Open Space Design; Personal Values and Design; Social Issues and Housing Form; and Toward More Socially Responsible Design. She has published widely in the environment and behavior field and has been addicted to EDRA Conferences since 1970.

LAURIE MUTCHNIK MAURER is a registered Architect. She received her training at Pratt Institute and has worked in the firms of Philip Johnson and Marcel Breuer. Since 1964 she has been a principal partner in the firm of Maurer and Maurer of Brooklyn, N.Y. From 1963-1978, she taught in the Department of Interior/Environmental Design at Pratt Institute. Her professional activities include chairing the New York State Board for Architecture, the Equal Opportunities Committee of the New York Chapter, AIA, and the Affirmative Action Committee of the American Institute of Architects.

ANNE PARKHURST is an Associate Professor at the Biometrics and Information Systems Center, University of Nebraska-Lincoln. She has taught courses in Biostatistics and consulted with colleagues and graduate students on the statistical aspects of their research. She has many publications to her credit, including the co-authorship of a book on Business Mathematics. Her current scholarly activity is in the development of new and innovative computer software to facilitate statistical consulting and teaching. Recently, she has
REBECCA L. PETERSON received her B.A. in psychology and sociology from the University of Kansas and Ph.D. in psychology from Claremont. Since 1972, she has been on the Faculty of Environmental Studies at York University. She has done numerous articles, presentations, and reports on women and environments (e.g., The Women's Movement and the Reframing of Urban Problems) and with Gerda Wekerle founded the Women and Environments International Newsletter. Since 1981, she has served as chairperson of the Committee on the Status of Women in Environmental Design Research (EDRA).

SUSAN SAEGERT did her graduate work at the University of Michigan, receiving the Ph.D. in Social Psychology in 1974. Since 1977, she has taught in the Environmental Psychology Program at CUNY. She has served in an editorial capacity for various scholarly journals, including Environment and Behavior and Human Ecology. She has been actively involved in the Center for the Study of Women and Sex Roles since 1977, as a member, the director, or on the executive committee. Recently, she has been invited to give numerous lectures on the effects of environmental design upon women.

LESLIE KANES WEISMAN has taught since 1968 and been an Associate Professor of Architecture at the New Jersey Institute of Technology since 1975. Included in her work in architectural education is the co-founding of the Women's School of Planning and Architecture in 1974. She has lectured widely to feminist groups, professional organizations and academic audiences. She is the author of Flight From Suburbia (1973) and numerous articles on architectural and feminist education and women as an environmental user group. She is currently writing a book about women, space and society.

Each of the presenters will begin by discussing the following issues:

DORIS COLE:

Less than five percent of the registered architects in the United States today are women. Though the number of women studying architecture is increasing, there is still a lack of understanding and a questioning of women's place in this profession.

Women in the United States have been active, influential participants in developing and formulating America's architecture. Historically, women have been major collaborators, if not prime instigators, in this field. From the raising of the tipi to the nineteenth-century concerned client and her carpenter, women have dealt with civil and domestic architecture. In the 1890's a few brave women trained for and practiced the profession of architecture blazing a path for other women to follow. Though their numbers are few, their accomplishments are many. Their houses, schools, hotels, churches, dormitories, auditoriums, and office buildings are part of the fabric of our towns and cities.

The accomplishments of women in architecture from the beginning of this country up to the present have been ignored by architectural historians. The conventional architectural book and course discusses the male architects of great and not-so-great worth. Through ignorance, or perhaps malice, they have not included the work of women architects. To fully understand the culture of this country and its architecture one must study, know, and understand the contributions of women to the living patterns and structures of our built environment.

CLARE COOPER MARCUS:

I will discuss the question of the acceptance and use of environment/behavior research in the design professions as a gender-related issue. Architecture is in a state of turmoil; modernism has fallen into disrepute and no strongly supported new ideology has emerged to replace it. User-based design could be a strong contender for a new rational and humane base to architecture, yet many schools are experiencing a withdrawal from this approach. Students with social concerns meet little support (sometimes even ridicule) in certain studio classes; and later, in many major architectural firms. There are indications that some architects view human concerns as "soft," "fuzzy," "ephemeral," and even "effeminate."

I would like to discuss a proposal that built-form and environment/behavior research represent the masculine and feminine principles of architecture; that women researchers and practitioners in the E/B field have, if anything, a slight advantage, since social concerns are
traditionally viewed as "women's issues"; and that, like the feminist cause, little will be gained until we come out of our closets and speak out forcefully for what we believe.

A parallel issue I will also address is the status hierarchy between architecture and landscape architecture; and the sense that social concerns are more acceptable to the latter profession. If architecture represents masculine principles (action, aggressiveness, hard lines), then landscape architecture clearly epitomizes feminine principles (organic growth and change, nurturance of natural processes). It is this dichotomy which is, I believe, at the base of a traditional, patriarchal view of architecture as being bigger, better and more powerful. (A design team is typically headed by an architect, with the landscape architect brought in at a later date, in a subordinate position.) This status difference is reflected in some of our current ecological concerns; caring for the land is given less value than building on it. My sense is that landscape architecture has been more welcoming of E/B researchers and teachers because an "underdog" profession is more open to the concerns of an "underdog" sub-discipline within its field; and because landscape architecture (unlike architecture) has never been strongly hide-bound by formal aesthetic ideologies.

We have often talked of bridging the gap. I believe this gap to be more profound and more gender-based than we have heretofore recognized. The more we succeed in bridging the gap--between the practice of architecture and social issues, between the professions of architecture and landscape architecture--the more we will be facilitating the emergence of a new wholistic discipline that can truly bear the name of "environmental design."

LAURIE MUTCHNIK MAURER:

My views on our topic, "The Gender Gap: Does it Exist in Environmental Design and Research?" would have to be prefaced with a great qualifier: my knowledge of all the many and diverse areas which could be said to make up this spectrum of activity is limited indeed. I feel qualified to speak only about the practice of architecture (and the traditional practice, at that) and to some extent about interior design.

But, taking this subject from this narrow viewpoint, my answer to the question would have to a resounding YES, there is a gap. There is a difference between the number of young women and young men who see architecture as an appropriate career choice; there is a reported difference in attitude on the part of the faculty and fellow students towards women students; there remains a large discrepancy in the "equal pay for equal work" department; women still represent an insignificant percentage of registered architects and comprise an equally small segment of the membership of traditional organizations such as the American Institute of Architects.

But most important of all, for the public and profession alike, the image of the architect in this country is still that of the white male. This minority status affects women in many ways: some, having survived the hazing ritual and achieved success, turn their back on women's issues and young women; others cannot endure the constant need to prove and re-prove themselves and drop out; others seek to evolve a more comfortable "women's architecture"; the majority, probably, persist quietly and settle for a small niche within the existing structure of the profession.

From what I see around, women pursuing paths in the traditional practice of architecture are not doing much that is noticeably different from the male variety of architect. The work of the few frequently published women-owned firms appears to be quite similar to that being done by any other firm. Since the number of women-owned firms remains very small, and those that are published are even smaller, there is not a lot of information on which to base these conclusions. But it would be my guess that women following this path would be intent on producing known quantity/quality work so as to give them the much-needed track record for required success in the profession.

And, moving along to the question of support for the "underdog", I have long been thinking about this and related subjects and have no firm conclusions. There may be, however, some significant difference in the way women (most women, that is) approach the client relationship. It seems to me that our culture still has different emphasis for its girl children and its boy children, and that attitudinal distinctions are still very much around. In general, that which we have come to call "nurturing" is an attitude or attribute still passed on (primarily) to girls from (primarily) their mothers and boys received another set of messages. This,
when translated into professional terms, could make women architects see themselves as the "nurturer", if you will, of the client's project, with the goal of helping the client realize the full potential of the idea. This can be contrasted with the more typically seen posture, where the architect and the client are almost in competition, not quite trusting each other, and each knowing better than the other what the right answer is. There is no data to support or disprove the "nurturing" theory, of course, but it has possibilities. And, of course, it would be precisely this attitude which would lead women to support the "underdog".

It is my feeling that the traditional profession of architecture would not be the place to look for significant innovative and/or theoretical contributions by women. In fact, one would not look there to find such contributions by men either. The newer, less defined, less programmed and more wondering areas which are umbrellaed under the names of "planning", "research", and "education", would be where I would expect a) the gender gap to be narrower (but not non-existent) and b) the contributions of women to be more dramatic.

SUSAN SAEGERT:

Women and men come to their transactions with the environment from different traditions and different structures of opportunity. While this generalization may not hold for all women and all men, powerful social, economic and historical factors have contributed to this divergence. Simply put, men have made the environment by making things and women have made it by making lives. In our economy, wealth acquires to those who control the making and exchange of things. Therefore, the endeavors of women have seemed at once worthless in the economic sense and priceless in the human sense.

To many, women's role in creating the environment has been invisible. When I first began to think seriously about these topics it seemed to me that women lived in a world made by and for men. I looked at the experiences of men and women living in suburbs and cities. Women in both locations felt torn by the necessary trade-offs of access to job alternatives and a stimulating adult life versus satisfactory housing, safety and what they thought to be a better environment for raising children. While men perceived the same kinds of attractions and drawbacks in urban and suburban locales, those we sampled found the combination of a suburban residence and a job in the city satisfactory, on the average (Saegert, 1980; Saegert & Winkel, 1980). It appeared to me, in grandly oversimplified form, that men had proceeded to build their preferred pattern of dwelling at a rapid clip and in the process reified a gender stratified division of labor. Women were left to stretch and compromise in an economic and cultural atmosphere requiring or encouraging them to combine work inside and outside the home. Statistics showed that while women in both cities and suburbs increasingly worked outside the home, the high paying jobs for women were most frequently located in the cities. Thus women's lesser economic power was reinforced by the pattern of land use that came to dominate the landscape in the postwar decades. From this perspective, metropolitan landuse patterns and transportation networks appeared to most crucially contribute to gender-based inequality. The small windowless apartment kitchen, the turnstile that did not accommodate pregnant women and strollers, and the many other built environment annoyances in the lives of women seemed to me to merely reflect the greater power and importance attached to male lives, both as producers and consumers of the environment. This analysis now seems to be inadequate in that it does not challenge the "thing" dominated conception of the environment nor probe the dynamics of patriarchy.

If we look at the environment as the milieu in which life is created, maintained, lost and recreated, then we see that women have always been central to the making of the environment. We see also that people are as much the environment as houses and trees, highways and window details. We see also that the physical form of the people is inseparable from the physical form of the non-human world. Hunching over a typewriter leads to bad posture and backaches. Children fed high-protein diets grow taller. Things also reflect their relationships to people. When people give their care to a neighborhood, there is little litter, more greenery. Buildings are in good repair. When people give their care to each other in a neighborhood, the streets are safer and children can play outside without their parents. But if we stick with the notion that care is matter seen from the point of view of sustaining life, we also see that people deprived of care cannot give it.
The environmental psychologist thus has something in common with women as a social category in that both try to bring the dimension of human experience to understanding the physical world. In conclusion, I will attempt to clarify what I think are some of the implications of this analysis:

1. Women's economic dependence on men must be understood as a concomittant of an economic system that assigns monetary value to commodities only. Thus even services such as childcare and education produce money only when delivered in the form of a commodity (i.e., in discrete units distinguishable according to ostensibly universal standards applied to both quality and quantity).

2. Men's greater biological and historical freedom to define themselves as individuals rather than as inalienably related to other people has resulted in a tradition of male attitudes that lends itself more readily to a view of the environment as composed of discrete things that can be appropriated for individual use.

3. The professions of architecture and planning accept a commodity defined view of the environment although advocates of vernacular design and participatory planning, design and production challenge this conception. These challenges do not however fully reject a view of the environment as a collection of non-living things.

4. Environmental design research has lacked a theoretical grounds for expecting gender differences in the experience of the environment except for those differences attributable to unanalyzed differences in physical and social conditions (i.e., women being smaller and weaker than men on the average, shaped oddly during pregnancy, lower paid, more likely to be responsible for housework and childcare, etc.).

5. The gender gap and the application gap (c.f. EDRA's conference entitled Bridging the Gap) may have in common the problem of being unable to bring about parity between the attention, expenditure of resources and priority (both legal and habitual) given to the environment viewed as the matrix of life and the environment viewed as a collection of things, i.e. defined as non-human, discrete and having monetary value.


LESLIE KANES WEISMAN:

The man-made environment is indeed man/made. It is largely the creation of white, masculine, subjectivity. It is neither value free or inclusively human. Architecture is a record of deeds done by those who have had the power to build. That power has been and still remains virtually a male monopoly. This does not mean that women have had no significant effect upon the shape of the environments in which we live and work - quite the contrary - only that we have usually done so by means other than those traditionally used by men (e.g., domestic advice books, urban beautification and rent strikes). In addition to describing what some of those means have been and are today, I will assert that because women are a socially disadvantaged group in our patriarchal society, we are also a spatially disadvantaged group. I will give examples of how this is reflected in zoning, transportation planning and housing policy.
THE SPATIAL COMPETENCE OF THE BORDERLINE RETARDED

Reginald G. Golledge
University of California, Santa Barbara

ABSTRACT

The purpose of this paper is to examine the spatial competence of mildly and moderately retarded populations to compare their levels of competence with a contrast group of normal adults from the same area, and to discuss sets of characteristics that appear to be related to spatial competence. Experiments covering both sequencing problems and two-dimensional spatial arrays are discussed in two separate contexts - Columbus, Ohio and Santa Barbara, California.

INTRODUCTION AND PROBLEM STATEMENT

The primary purpose of this paper is to analyze one and two dimensional cognitive representations by groups of deinstitutionalized borderline retarded individuals in Columbus, Ohio and Santa Barbara, California. The output from this testing is compared with similar efforts by groups of socio-economically deprived normal adults living in the same neighborhoods as the borderline retarded subgroups. The implications of this study for environmental learning theories and theories of psychological development in a spatial context are also examined (see Golledge, Parnicky, and Rayner, 1979).

Much of the research on spatial cognition and cognitive mapping has been limited to populations of adults or children; these groups are usually described as (intellectually) "normal" populations. In many cases, however, the populations chosen have cognitive abilities expected to be above average - i.e., they consist of university students. Our project (Golledge, Parnicky, and Rayner, 1979) deliberately sought populations at the other end of the intelligence spectrum in order to test specific hypotheses concerning their spatial competence: i.e., their way finding abilities and their ability to make interpretable decisions concerning locational relations of things in two and three dimensional spatial environments. A secondary purpose was to determine the extent to which existing adaptive behavior scales reflected spatial abilities, and to determine if such scales should be modified by including a spatial competence component in order to increase their usefulness in predicting whether or not a deinstitutionalization process was likely to be successful.

Since there is an increasing variety of reviews of spatial cognition and environmental cognition in the published literature of many fields, I will not attempt to review the status of theory and empirical work here (but see Evans, 1980 and Golledge, 1983). Rather, I will focus on describing the nature of our experiments and report on the outcomes to date.

CONCEPTUAL BASIS

Underlying our research is the anchor point theory of environmental cognition and its central concept of hierarchical ordering of spatial information (Golledge, 1978; Evans, 1980). Briefly, this theory suggests that the process of learning about a new environment can be conceptualized as follows:

(i) major places (anchor points) associated with home, work, shopping and perhaps recreation first become known, along with major routes (paths) connecting them. Some spread effects occur in the vicinity of these anchor points such that specific environmental cues signal when one is "approaching work" or "entering one's home neighborhood";

(ii) sets of secondary cues and paths develop in the vicinity of the anchoring points and paths. Some of these represent places of interaction (e.g., a restaurant for lunch) and some are major decision points (e.g., a highly visible landmark along the road to work, a major freeway sign or exit, or a particular road intersection);
(iii) spatially related sets of primary, secondary and lower order nodes and paths develop, and are hierarchically linked to each other. Where this node-path network is complex, areal generalization occurs and concepts such as "neighborhood", "community area", and "region" emerge.

Given this conceptualization, it is almost axiomatic that, if one or more anchor points is "misplaced" in some way, an entire segment of space will also be "distorted". If one images two anchor points to be close together, even when they are not, then the interaction potential between them increases as the subjective distance between them decreases. So if one thinks of the central area of a city as being "difficult to get to", or if, because of one's perception of the magnitude of pollution, crime, parking problems (and so on) an area appears "undesirable" or stressful, there is a tendency to mentally "push the place away" or to cognitively increase the spatial separation between such a place and other portions of one's mental map. This produces a distortion that can be recovered and represented cartographically. By transforming a standard street map to "fit" one's cognitive representation, we obtain a picture of the "world in the head" - the mapping of reality that influences where we go and why we go there instead of elsewhere. Examination of such transformed maps provides clues as to why some distant places are patronized when closer equivalents exist, and reveals much about the time-path movements by different population subgroups. This environmental learning process appears to describe how normal adults accumulate information about an environment. The time span differs for permanent residents as opposed to visitors or temporary residents. Whereas the latter subjects may need immediate and continued access to supplementary (ancillary) information such as maps, city directories, yellow pages or mass media information so that a minimal spatial knowledge structure emerges and can be used in a particular purposeful context, the former group carries much of the spatial information needed for daily interactions in its mind. The conceptualization of environmental learning also assumes, however, that people have the cognitive ability to recognize and order cues of various types, and to connect these cues spatially, sometimes in one dimension (as sequentially along a given route), and sometimes in two or three dimensions (e.g., recognizing that a place not previously visited can be accessed from a number of alternative locations or paths).

STUDY AREAS

The two study areas chosen were urban neighborhoods of approximately four square miles in Columbus, Ohio and Santa Barbara, California. In Columbus, the neighborhood was located between the Ohio State University and the central business district, and consisted of a high density residential neighborhood with a wide range of community features including shops, restaurants, schools, theaters, churches, and so on. The Santa Barbara neighborhood was located in a lower density suburban community in which there was more open space and fewer urban service functions. Cues in both areas were selected by interviewing the residents of the group homes as well as a selection of the population residing in the general area.

SUBJECT SAMPLE

Twenty-two young adults at various stages of retardation participated in the study: 16 were from Columbus; 6 from the Santa Barbara area. Arrangements were made with the Association of the Mentally Disabled in Columbus and with the Devereux Schools in Goleta to recruit subjects. In each case, it was required that members of the retarded subgroup had been living in the area for a period of at least six months before the start of the experiment. Subjects who were known to have brain damage were excluded from the sample. The remaining subjects had no physiological disadvantages and were able to travel throughout their local areas by foot or cycle, as a passenger in an auto, or by public transport.

As opposed to the above experimental group, two contrast groups of normal adults (a total of 44 persons) also participated in critical parts of the project. For the contrast groups, length of residence ranged from one to 36 months, with the average length of residence roughly equivalent to the experimental group. Twenty-nine subjects were tested in the Columbus area; fifteen were from the Santa Barbara area. Most were unemployed at the time of the experiment.
For the retarded subgroup the experiment consisted of five separate sessions. The sessions ranged in length from one to two hours and were conducted individually with each subject. All experiments with the retarded subgroups in both areas were conducted by licensed psychologists who had experience working with members of the sample populations. The results of the experimental sessions were recorded on questionnaires, maps, and by video and magnetic tape. Information about the experimental groups was also collected from the professional staff supervisors at each of the group homes. A brief outline of the nature of each session is summarized in Figure 1. Contrast subjects only performed the one dimensional sequencing and two dimensional map board tasks. Comparisons amongst the sample groups are restricted to these spatially oriented experiments.

Some of the literature on development argues that retarded individuals should pass through all the same stages as normal adults but at a considerably slower rate or over a longer period of time (Zigler, 1969; Weisz and Zigler, 1979; Weisz and Yates, 1981). Alternate hypotheses (Milgram, 1973) suggest that the cognitive stages of the retarded differ from those of the non-retarded. General theories of cognition posit that individuals make a transition from egocentric spatial knowledge through route learning phases to a general two dimensional survey knowledge. A hypothesis consistent with general development theory, and a segment of literature on cognitive development of the retarded, therefore, is that our borderline retarded individuals should be able to progress through one dimensional route learning to two dimensional survey knowledge. The alternative hypothesis is that no amount of environmental experience will raise a subject's spatial knowledge to the survey level if the subject doesn't have the cognitive capacity of progressing to that stage of development.

Several experiments were designed to test the above hypotheses. The first task involved only the Columbus experimental group and consisted of examining pairs of slides and determining which slides were "on" or "off" a given route between two well-known origin and destination points (i.e., a route identification task). Each subject was told to imagine he was traversing a path from his home to a given location; five different routes and destinations were used in all. Specific destinations included their work places, a neighborhood shopping place, a movie theater, a shopping mall and a major department store in the downtown area. All places were patronized on a regular basis by each member of the subject population. As each subject was shown slides of simultaneously projected cues, they were asked to identify each one, comment on its use, and specify its location, as well as identifying if it was on or off a given route.

A second task involved both the Columbus and Santa Barbara experimental groups. This was a laboratory task in which a yard long strip of wood was placed before the subject and a researcher informed the subject that the strip represented a particular route between a given origin and destination. Once the subject had confirmed that he knew the origin and destination and understood the task of getting between the two, the subject was given a set of wallet sized photographs of landmarks along the route - the presentation sequence being randomized for each subject. For each cue in turn, the subject was given the task of placing it along the route so that: (a) all cues were arranged in a correct monotonic sequence along the board; and (b) once the cues had been sequenced, they were positioned to reflect their actual distances apart. Apart from the origins and destinations, five intermediate cues were used along each route.

Another experiment was oriented towards extracting two dimensional understanding of spatial relationships (survey level knowledge) and involved a map model methodology. Here each subject was positioned before a rectangular plywood board (roughly three feet by four feet) with strips of three quarter inch wide tape along each of the four sides. After preliminary instructions as to the nature of a map and a test of the ability of the subject to image the board as a map, subjects were asked to identify the major boundary streets and major streets bisecting the rectangle. Once the street names and relations had been established to the satisfaction of the experimenter and to the ability of the subject, the individuals were shown a photograph of their residence and asked to locate it on the map board. If the subject was not able to place the photo on the map board, the experimenter located the photo, and carefully explained the notions of location with
Figure 1: Test Sessions

I
1) Naming places in Columbus
2) Identifying slides of 20 places in Columbus
3) Preliminary map board responses
4) Plotting pictures of places in neighborhood area on map board
5) Naming what one sees in city, suburban, country areas
6) Identifying slides of places in city, suburban, country areas

III
1) Wide Range Achievement Test
   a) Spelling
   b) Reading
   c) Arithmetic
2) AAMD Adaptive Behavior Scale
   a) Social Skills
   b) Deviant Behaviors

IV
1) Places On/Off Routes
   a) to Grocery Store
   b) to Workshop
   c) to Shopping Mall
   d) to Downtown Department Store
   e) to Neighborhood Movie
2) Sequence Places Along Routes
   a) to Grocery Store
   b) to Workshop
   c) to Shopping Mall
   d) to Downtown Department Store
   e) to Neighborhood Movie

CONTRAST GROUP
1) Naming places in Columbus
2) Identifying 20 slides of Columbus
3) Preliminary map board responses
4) Plotting pictures of places in neighborhood on map board
5) Naming what one sees in city, suburban and country areas
6) Identifying slides of places in city, suburban and country areas
7) Sequencing places along routes
8) Personal background information
respect to surrounding streets to the subject. Each subject was then sequentially presented with 19 other pictures of other landmarks. As subjects were presented with each mounted photograph of a cue, they were asked to identify the picture, explain what the place was used for, describe its location verbally, and place the picture on the map board at a location specified by the subject. Subjects were given the right to move particular cues that had already been placed on the board at any time during the experiment (a record was kept of the number of such moves on the videotape); subjects were again given the opportunity to reposition any or all of the cues after the full set of cues had been presented.

Essentially the purpose of these experiments was to determine if the subjects had both a one dimensional or route level knowledge of their neighborhood and a two dimensional survey level understanding of their neighborhood. The particular problems tested were whether the sequencing and distancing characteristics of the route configuration and the locational arrangement on the map board in any way matched a real world sequencing of cues or an objective two dimensional Euclidean mapping of the location of all cues (respectively). Note that, while a two dimensional Euclidean mapping is used as a standard base in all these experiments, comparisons have also been made with other Minkowskian metrics such as city block and dominance metrics.

TESTING PROCEDURES

Testing consisted of calculating non-parametric correlations and bidimensional regression coefficients (Tobler, 1978) to determine the degree of correspondence between: (a) the subject's cue sequence information and actual cue orders, and (b) the two dimensional map board configurations and a map of objective reality of the same locations. The assessment of the significance of the correlation coefficients was undertaken using a non-parametric randomization strategy known as QAP (Hubert and Schultz, 1976; Hubert and Golledge, 1981; Richardson, 1982). Measures of fit thus obtained were then correlated with the data collected from the subjects such as their adaptive behavior scores, I.Q.'s, residential histories, and so on. In addition to the statistical analysis, cartographic analysis was undertaken of the map board results. Using again a bidimensional regression procedure, the goodness of fit between subjective and objective configurations was determined, and for the groups as a whole, representations of the distortion and fuzziness components of map error were calculated (see Gale, 1980, for a discussion of these error terms).

SURVEY RESULTS

a) The Sequencing Experiments

A Spearman rank correlation coefficient between the order of cognized locations along each route and the actual locations along each route in the Columbus area showed considerable variability amongst the experimental group subjects (Table 1). Of the five routes used in the experiment, the route to work (ARCraft West) consistently had the highest correlations. Examination of the correlations for each of the other routes showed a somewhat similar but slightly lower range than those found for the journey to work. Interestingly, the route to downtown, a route that would have to be traveled by bus, produced better results than other routes in the neighborhood where walking was the major mode of transport.

For the contrast group of normal adults the overall pattern of correlations is substantially greater than the experimental group. The highest correlations for this group were related to the most frequently traveled route - to the Big Bear neighborhood grocery store. In comparison to the retarded subgroup, twenty of the twenty-nine contrast subjects perfectly rank ordered all the cues along that particular route.

A supplementary analysis was undertaken of the frequency with which each cue on each route was correctly located (Richardson, 1982). In general, the following holds: (i) cues closest to the origin were correctly positioned most frequently; (ii) cues adjacent to the destination were correctly positioned the next most frequently (but significantly less than those near the origin); and (iii) cues near the middle of the route were most frequently mislocated. These results concur with some previous speculations about the hierarchical nature of spatial understandings (Golledge, 1978; Golledge and Spector, 1978). This previous research posited
TABLE 1  
Spearman Correlation Between Route Sequencing Data and Reality

<table>
<thead>
<tr>
<th>Subj ID#</th>
<th>Big Bear</th>
<th>ARC West</th>
<th>Gold Cir</th>
<th>Lazarus</th>
<th>Univ Flick</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exp. Grp.</strong></td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
</tr>
<tr>
<td>002</td>
<td>-.09</td>
<td>-.20</td>
<td>.03</td>
<td>-.09</td>
<td>-.09</td>
</tr>
<tr>
<td>003</td>
<td>.66</td>
<td>.89*</td>
<td>.89*</td>
<td>.03</td>
<td>.09</td>
</tr>
<tr>
<td>004</td>
<td>.70</td>
<td>.89*</td>
<td>.54</td>
<td>.60</td>
<td>.83*</td>
</tr>
<tr>
<td>005</td>
<td>-.09</td>
<td>.77*</td>
<td>.54</td>
<td>.60</td>
<td>.94*</td>
</tr>
<tr>
<td>007</td>
<td>.94*</td>
<td>.89*</td>
<td>1.00*</td>
<td>.88*</td>
<td>.83*</td>
</tr>
<tr>
<td>008</td>
<td>.48</td>
<td>.60</td>
<td>-.37</td>
<td>.83*</td>
<td>.77*</td>
</tr>
<tr>
<td>009</td>
<td>.83*</td>
<td>.94*</td>
<td>.83*</td>
<td>.89*</td>
<td>.60</td>
</tr>
<tr>
<td>010</td>
<td>1.00*</td>
<td>.77*</td>
<td>.26</td>
<td>.77*</td>
<td>.77*</td>
</tr>
<tr>
<td>011</td>
<td>.71</td>
<td>.65</td>
<td>.89*</td>
<td>.89*</td>
<td>.43</td>
</tr>
<tr>
<td>012</td>
<td>.94*</td>
<td>.03</td>
<td>-.03</td>
<td>.90*</td>
<td>.49</td>
</tr>
<tr>
<td>013</td>
<td>.49</td>
<td>.43</td>
<td>.60</td>
<td>.77*</td>
<td>.77*</td>
</tr>
<tr>
<td>014</td>
<td>.83*</td>
<td>.77*</td>
<td>.37</td>
<td>.08</td>
<td>.37</td>
</tr>
<tr>
<td>015</td>
<td>.60</td>
<td>.77*</td>
<td>-.03</td>
<td>.08</td>
<td>-.09</td>
</tr>
<tr>
<td>016</td>
<td>.09</td>
<td>.14</td>
<td>-.37</td>
<td>.77*</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Cont. Grp.</strong></td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
<td>rs</td>
</tr>
<tr>
<td>102</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.94*</td>
<td>.94*</td>
<td>1.00*</td>
</tr>
<tr>
<td>103</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
</tr>
<tr>
<td>104</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
</tr>
<tr>
<td>105</td>
<td>.94*</td>
<td>.60</td>
<td>.83*</td>
<td>.94*</td>
<td>1.00*</td>
</tr>
<tr>
<td>106</td>
<td>.94*</td>
<td>1.00</td>
<td>1.00*</td>
<td>.60</td>
<td>.83*</td>
</tr>
<tr>
<td>107</td>
<td>1.00*</td>
<td>.66</td>
<td>1.00*</td>
<td>.94*</td>
<td>.94*</td>
</tr>
<tr>
<td>109</td>
<td>.43</td>
<td>.03</td>
<td>.94*</td>
<td>.26</td>
<td>.25</td>
</tr>
<tr>
<td>110</td>
<td>1.00*</td>
<td>.89*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.97*</td>
</tr>
<tr>
<td>112</td>
<td>.94*</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.98*</td>
</tr>
<tr>
<td>113</td>
<td>1.00*</td>
<td>.66</td>
<td>.94*</td>
<td>.77*</td>
<td>.94*</td>
</tr>
<tr>
<td>114</td>
<td>1.00*</td>
<td>.37</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
</tr>
<tr>
<td>115</td>
<td>.94*</td>
<td>1.00*</td>
<td>.94*</td>
<td>.97*</td>
<td>1.00*</td>
</tr>
<tr>
<td>116</td>
<td>1.00*</td>
<td>.77*</td>
<td>.94*</td>
<td>.94*</td>
<td>1.00*</td>
</tr>
<tr>
<td>117</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
</tr>
<tr>
<td>118</td>
<td>1.00*</td>
<td>.66</td>
<td>.94*</td>
<td>.77*</td>
<td>.94*</td>
</tr>
<tr>
<td>119</td>
<td>.94*</td>
<td>.94*</td>
<td>.49</td>
<td>.83*</td>
<td>.89*</td>
</tr>
<tr>
<td>120</td>
<td>1.00*</td>
<td>.60</td>
<td>1.00*</td>
<td>.71</td>
<td>.84*</td>
</tr>
<tr>
<td>121</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
</tr>
<tr>
<td>122</td>
<td>1.00*</td>
<td>.49</td>
<td>.94*</td>
<td>.66</td>
<td>.94*</td>
</tr>
<tr>
<td>123</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
</tr>
<tr>
<td>124</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.77*</td>
<td>.83*</td>
<td>1.00*</td>
</tr>
<tr>
<td>125</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
<td>.94*</td>
</tr>
<tr>
<td>126</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.77*</td>
<td>.94*</td>
</tr>
<tr>
<td>127</td>
<td>1.00*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.83*</td>
<td>.94*</td>
</tr>
<tr>
<td>128</td>
<td>.94*</td>
<td>1.00*</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
</tr>
<tr>
<td>129</td>
<td>1.00*</td>
<td>.94*</td>
<td>1.00*</td>
<td>.48</td>
<td>.89*</td>
</tr>
<tr>
<td>130</td>
<td>1.00*</td>
<td>.66</td>
<td>.94*</td>
<td>1.00*</td>
<td>.89*</td>
</tr>
<tr>
<td>131</td>
<td>1.00*</td>
<td>.83*</td>
<td>.94*</td>
<td>.60</td>
<td>.94*</td>
</tr>
<tr>
<td>132</td>
<td>.83*</td>
<td>.83*</td>
<td>.83*</td>
<td>.83*</td>
<td>.77*</td>
</tr>
</tbody>
</table>

* Spearman rank correlation coefficients statistically significant at .10 level.

the existence of a hierarchical ordering of cues with the major points of familiarity acting as anchor points in a cognitive representation of an objective environment, and with subsidiary cues attached to the primary nodes being more accurately located than cues attached to secondary or lower order nodes or those cues most distant from the primary nodes. Results also tend to support Allen's (1981) hypothesis that routes consist of cognized segments with different degrees of certainty attached to each segment of the total route.

Richardson (1982) calculated average cue displacements along each route for both the experimental group and the contrast group. He pointed out that a range of displacements occurred, with the contrast group generally having smaller average displacements for each cue along each of the 5 routes. For two of the five routes (ARCraft West and the trip to Lazarus Department Store) both subject groups displaced the same cues the same relative amounts. For other routes, significant differences occurred. If we focus on the two routes most used and best known by our experimental group, the results appear to suggest that as routes become better known, then cue displacement characteristics (or locational errors) are similar to those which might be expected from a normal adult subject population.

The final stage of analysis of the one dimensional experiment was to determine the distortion and fuzziness components of the cognized cue placements. Distortion in each case is calculated for each cue and represents a difference between the mean cognized location and the actual location of a landmark along the given route. Fuzziness, the other component of location error, is represented by the standard deviation of the cognized locations for a particular cue by the entire group of subjects (Gale, 1980). The results again showed that cues closest to the origins and destinations were relatively less distorted than those in the middle of the route, and that fuzziness was smaller for the cues closest to the origin and destination than for those in the middle of the route. This result was similar for both experimental and contrast groups.

b) The Map Board Experiment

The basic hypothesis tested here is that subjects who progress to the stage where they have a two dimensional survey knowledge of their neighborhood will have cognitive configurations similar to the actual configuration of cues. Operationally, this implies that the placement of cues on a map board (with X,Y coordinates) is highly positively correlated with the real world locations (having X,Y coordinates). The method used to assess the degree of correspondence is called bidimensional regression. Two parallel methodologies (Tobler, 1978; Rayner, 1980) were used to calculate the bidimensional regression statistics.

The average correlation for the Columbus experimental group (n = 15) is .315 and for the Santa Barbara experimental group (n = 6), .595. The Columbus contrast group (n = 29) had an average correlation of .632 while the Santa Barbara contrast group's correlation (n = 14) was .875. Clearly the cognitive configuration of the contrast groups from Columbus and Santa Barbara had a higher fit to the chosen reality than those of the corresponding experimental groups. This was true both in the aggregate and for the bulk of the individual cases. However, some of the individual experimental subjects did have correlations greater than members of the contrast group from their particular study area (Table 2).

SPATIAL COMPETENCE AND SUBJECT CHARACTERISTICS

Richardson (1982) has examined the relationship between a subject's performance on each of the preceding experimental tasks and variables describing their intellectual ability, developmental level, behavioral characteristics, and environmental experiences (Table 3).

Six of the variables were found to be statistically significant (.10 level) when correlated with the CONGRU Statistic. In other words, high scores on each of those variables appear to indicate that a satisfactory level of survey-type knowledge has probably been achieved. Although strictly speaking the experimental and contrast groups in each test site were not comparable, what is obvious in each case is the substantial differences between the performance by contrast and experimental groups on the two dimensional (or survey knowledge) type experiments. While one dimensional
### TABLE 2
Bi-dimensional Correlation Between Map Board Configuration and Reality

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Bidimensional Correlation Coefficient</th>
<th>Subject ID</th>
<th>Bidimensional Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>0.27</td>
<td>901</td>
<td>0.18</td>
</tr>
<tr>
<td>003</td>
<td>0.40</td>
<td>902</td>
<td>0.71</td>
</tr>
<tr>
<td>004</td>
<td>0.39</td>
<td>903</td>
<td>0.92</td>
</tr>
<tr>
<td>005</td>
<td>0.27</td>
<td>904</td>
<td>0.78</td>
</tr>
<tr>
<td>006</td>
<td>0.14</td>
<td>905</td>
<td>0.89</td>
</tr>
<tr>
<td>007</td>
<td>0.41</td>
<td>906</td>
<td>0.29</td>
</tr>
<tr>
<td>008</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cont. Grp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>010</td>
<td>0.72</td>
<td>701</td>
<td>0.91</td>
</tr>
<tr>
<td>011</td>
<td>0.07</td>
<td>702</td>
<td>0.48</td>
</tr>
<tr>
<td>012</td>
<td>0.32</td>
<td>703</td>
<td>0.95</td>
</tr>
<tr>
<td>013</td>
<td>0.18</td>
<td>704</td>
<td>0.92</td>
</tr>
<tr>
<td>014</td>
<td>0.46</td>
<td>705</td>
<td>0.91</td>
</tr>
<tr>
<td>015</td>
<td>0.33</td>
<td>706</td>
<td>0.71</td>
</tr>
<tr>
<td>016</td>
<td>0.29</td>
<td>707</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>708</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>709</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>710</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>711</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>712</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>713</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>714</td>
<td>0.95</td>
</tr>
</tbody>
</table>

### TABLE 3
Spearman Rank Correlation Coefficient Between CONGRU² and Each Independent Variable

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>r with CONGRU²</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ</td>
<td>0.43**</td>
</tr>
<tr>
<td>WRAT reading</td>
<td>0.47*</td>
</tr>
<tr>
<td>WRAT spelling</td>
<td>0.43*</td>
</tr>
<tr>
<td>WRAT arithmetic</td>
<td>0.54*</td>
</tr>
<tr>
<td>Length of residence</td>
<td>-0.17</td>
</tr>
<tr>
<td>ABS independent functioning</td>
<td>0.20</td>
</tr>
<tr>
<td>ABS physical development</td>
<td>0.16</td>
</tr>
<tr>
<td>ABS economic activity</td>
<td>0.46*</td>
</tr>
<tr>
<td>ABS language development</td>
<td>0.22</td>
</tr>
<tr>
<td>ABS numbers and time concept</td>
<td>0.53*</td>
</tr>
<tr>
<td>ABS domestic activity</td>
<td>0.05</td>
</tr>
<tr>
<td>ABS vocational activity</td>
<td>0.06</td>
</tr>
<tr>
<td>ABS self-direction</td>
<td>0.05</td>
</tr>
<tr>
<td>ABS responsibility</td>
<td>-0.34</td>
</tr>
<tr>
<td>ABS socialization</td>
<td>0.04</td>
</tr>
</tbody>
</table>

* statistically significant at .10 level or higher

capabilities were somewhat similar (with the more severely retarded individuals performing less well in each case, and some relative newcomers among the contrast group performing equally poorly as the mildly and moderately retarded subgroups), nonsignificant differences occurred amongst each subgroup with respect to one dimensional or route sequencing experiments. Obviously, even moderately retarded individuals can learn to navigate from their home to selected destinations within the urban area - including work places, shopping places, and places of recreation and entertainment. Their knowledge of these routes includes an ability to be able to distinguish cues that give them information as to how close they are to an origin, destination, or to some significant intervening points. As familiarity with the destination decreases, then the degree of fuzziness of cue knowledge along the route increases. This is much more marked for the retarded subject groups than for the contrast groups but it is evident amongst each of the groups to a different extent.

Once we turn to survey level knowledge, however, it is quite apparent that, as far as this particular experiment is concerned, the retarded subjects did not have the ability to provide information on their two dimensional survey knowledge. Although they were carefully monitored throughout the map board experiment, it is possible that variables such as length of attention span, and limited ability to cumulatively store information, may have prevented them from adequately completing the photo placement task. Whatever the rationale, the results clearly show locational arrangements indistinguishable from random placements of the cues on the map board.

What needs to be examined further by carefully designing other experiments, is to determine whether some type of abstract knowledge system exists amongst the borderline retarded such that they know where a given cue is in relation to a set of other cues in a given environment. It also appears that route learning tasks could proceed by focusing on specific sets of intermediate cues identified at strategic points along the route which give signals as to directional changes, or proximities to major decision points, origins or destinations. For example, each of the routes examined in the Columbus situation was from 2 to 4 miles long and the success of the experimental subjects in adequately recognizing the correct sequence of cues along most of these routes indicates that one dimensional or route sequence knowledge can be used to encourage them to undertake extensive origin-destination trips throughout the urban area. Since the routes included neighborhood level trips as well as trips to the city center, it can be expected that those individuals exhibiting reasonable degrees of spatial competence can be trusted to navigate successfully in complex environments over substantial distances.

In the Columbus case, the final experiment involved field testing subjects to examine latencies in the field and to compare times associated with tasks outward from an origin and backward from a destination. The field tests indicated that return trips were generally undertaken in a faster time and with a greater degree of confidence then outward trips. This implies that route learning was undertaken of the trip out and some ability to reverse knowledge is attained by the subject population. The ability to reverse knowledge is a critical factor in preventing individuals from becoming lost on spatial expeditions. Other experiments that could be undertaken to test this hypothesis would involve taking individuals to an unknown site in the vicinity of well-known cues and seeing the manner in which they re-orient themselves.

Experiments along these lines using children in the 6-10 age group are currently being undertaken in the Santa Barbara area (Smith, Pellegrino, and Golledge, 1982). It is expected that these particular experiments may be capable of being duplicated with other populations such as subjects similar to our borderline retarded subgroups.

The overall conclusions from this set of experiments is simply that borderline retarded subjects achieved a satisfactory level of route sequencing knowledge but did not appear to have obtained survey level knowledge. This throws some doubt on the existing hypothesis that borderline retarded individuals will progress through all the developmental stages. While other more specific experiments have to be designed to thoroughly test this hypothesis, it may be that such populations never achieve the degrees of survey level spatial competence normally expected in adult populations.
REFERENCES


THE IDEOLOGY OF DESIGNING FOR THE DISABLED

Some thoughts on cultural influences in the United States and Britain on design formulations and their moral and ethical bases

Selwyn Goldsmith
Department of the Environment, London, UK*

ABSTRACT

The focus of this paper is on the moral and ethical bases for the design of macroenvironmental provision for disabled people, in particular barrier-free facilities in public buildings. An analysis of US and UK cultural values indicates that the formulation of a coherent design ideology could only have come from the US, with its self-help cultural values of enablement, equal treatment and idealism, and not from the UK with its social welfare cultural values of compensation, special treatment and pragmatism.

The historically significant document of the international barrier-free movement is the American Standard Specifications for making buildings and facilities accessible to and usable by the physically handicapped, issued first in 1961 and subsequently revised in 1980. Its prescriptions indicate a therapeutic attack on the macroenvironment rather than the microenvironment, and a focus on physical rather than social remedies. It also displays two important moral axioms; first the goal of normalization and non-discrimination, and second the value of independence; for designers, the practical application of these axioms poses dilemmas, particularly with reference to the perceived paramountcy of wheelchair user requirements.

Differences between US and UK design practice are discussed in the context of this ideology, for example relating to the planning of wc compartments. There is comment on comparative transportation and housing practices. The paper concludes with a plea for empirical evidence which can inform design decisions.

* The author emphasizes that the views expressed in this paper are personal, and must not be held to represent the policy views of the UK Government.

INTRODUCTION

The invalid tricycle, unisex public toilets, perplexing access signplates and awkwardly uneven curb cuts. These, in the arena of environmental provisions for disabled people, are among the curiosities of Britain, manifesting a culturally distinctive ethos.

The invalid tricycle is (or mostly was) a small, single-seat, tiller-steered, three-wheel, petrol-driven vehicle, purpose-designed for non-ambulant disabled drivers. Known affectionately as the "noddy car", it was until 1976 issued free of charge under the National Health Service to severely disabled people. Deriving from a motorized bath chair (perceived for bureaucratic purposes as a prosthesis), it evolved following the second world war into a small car to meet the needs of disabled ex-servicemen and disabled people who needed personal transport in order to get to work. On the one hand it was an instrument of compensation, and on the other of enablement. Through the 1960s and 70s it was increasingly criticized; it was unsafe, it was anti-social, and it was stigmatizing. There was also the lobby of "disabled passengers", who felt that ability to drive ought not to be a condition of welfare assistance for personal transport. And so, in response to the pressures, the Government ceased production of the tricycle; in its place the compensatory mobility allowance benefit was introduced in 1976 (1).

The unisex public toilet is, in the field of design for the disabled, a British product. It had not historically been orthodox practice in Britain that public toilets should have shared-sex facilities, but for the disabled there was the social welfare ethic of concern for the dependent as well as the independent, and
if a disabled woman had to be helped by her able-bodied husband (or the other way about), the logical solution was a generously spaced unisex facility, planned commonly between the male and the female sectors. During the 1970s, encouraged by official guidance in a government circular (MHLG, 1968), unisex public toilets, either new-build or restructured existing facilities, became a feature of the urban landscape and of public buildings (2). Within these public toilets, it is unusual to find a plan layout or disposition of fittings and rails which accords precisely with the official recommendations, indicating that, among architects and designers, there is a confidence that they can, by benefit ofunch or the example of a particular disabled person they happen to know, do better by doing differently. There have also been well-publicized instances of specially planned wheelchair toilets located at the top or bottom of a flight of steps (3).

A feature of the street scene in Britain is signposts indicating the location of facilities for disabled people, usually public toilets. The information afforded is commonly perplexing; of the two examples on accompanying slides, one is a signplate displaying the access symbol and nothing else, and the other is a signplate saying "public laundry" alongside the symbol - advertising perhaps a facility where wheelchairs can be washed?

In Britain, curb cuts are frequently an obstacle to wheelchair progress. Many highway authorities have, in response to exhortations from disability organisations, effected a policy of cutting curbs at street intersections. But there is not, typically, a co-ordinated programme whereby curbs are cut to link accessible routes. Instead, they are cut when street works happen to be undertaken, and instructions are issued. In the execution of curb cuts, there is little evidence of design consistency or technical supervision, as there is, for example, in Washington DC.

The thesis

These examples do not typify the professional performance or competence of architects and designers in Britain; their relevance to the theme of this paper is the cultural attitudes to disabled people which they display. Later there will be discussion on the very different ethic manifested in the United States.

The contention is that the differences observable in UK and US approaches to designing for the disabled stem from two distinctive cultural ethics regarding societal treatment of disabled people - the social welfare culture of Britain and the self-help culture of the United States. An analysis of opposing cultural values indicates that a coherent ideology for designing for the disabled could only have evolved in the self-help culture of the United States. Commentaries on the genesis of the movement confirm a doctrine of normalization and independence, exemplified in the specifications of the American Standard (ASA, 1961).

I ought at this point to assert my own moral stance. I am convinced that the international barrier-free movement is, and will continue to be, a positive force which is contributing to the shaping of better environments, not only for disabled people but for all. While I regret the paucity of demographic evidence which might assist the work of designers in this field, I acknowledge that the moral rightness of the cause is self-evident; there can be no dispute that conventionally designed buildings and facilities are inimical to disabled people, and that barrier-free environments must be beneficial.

SELF-HELP AND SOCIAL WELFARE CULTURES

For the examination of cultural influences on the ethical bases for designing for the disabled, there is posited on the one hand the self-help culture, exemplified by the United States, and on the other the social welfare culture, exemplified by Britain. There is no contention that polarities are always marked in the ideologies of the two cultures, but, for the purposes of illustrating the discussion which follows, contrasting social values are listed at the head of the following column which tend (or have tended) to characterize the two cultures in their treatment of disabled people. The terms are self-explanatory; the only one which warrants elaboration at this stage is "doctrinality", by which I mean a readiness to make doctrinal leaps without having first looked cautiously at all the obstacles.
Examination of these contrasting values suggests that the self-help formula is potentially better constituted for translation into a positive design ideology. It prompts images of discipline, conformity, structure and organisation, whereas the social welfare formula is about untidiness, selectivity, confusion, ad hoc arrangements and the accommodation of eccentricity. The self-help formula indicates an amenability to regulatory controls and legislation. By comparison the social welfare formula indicates a preference for education and exhortation; it is cautious and sceptical and disinclined to make hazardous doctrinal leaps.

In the context of designing for the disabled we can discern that the self-help culture has a more practical approach than the social welfare culture, reflecting a tendency in America to look for physical alleviations. It does not want special vehicles for the handicapped - it wants accessible bus and subway systems; it prefers for its public toilets for there to be a presumption of self-management; it expects that information on signplates will be unambiguous; and it makes sure that its curb cuts are functionally structured. By contrast, in Britain the provision of physical facilities for disabled people is perceived more as a component of the overall social fabric. The examples of the invalid tricycle, unisex public toilets, public signplates and awkward curb cuts are manifestations of a society with a morality of community concern and compassion for disabled people, which it is anxious to display; the ethic is of special welfare treatment and of finding a pragmatic rather than an ideal way of doing things, and there is cursory regard for applying design rules in a functionally efficient fashion. But I ought at this point to note that I believe the social welfare model, with its image of paternalism and philanthropy, is being dented by the impact of the barrier-free movement, known in Britain as "access".

Legislation, in sections 9-15 of the Chronically Sick and Disabled Persons Act of 1970, requires that the interests of disabled people are represented on the boards of national agencies. And consumer representatives have become more vocal in their challenges to established social welfare practices: it is commonly the inaccessibility of buildings and facilities which is the target for attack (4), following the pattern in America where, as is demonstrated in the literature (5), the disabled consumer rights movement has predominantly focused on access in its campaign against discrimination.

THE AMERICAN STANDARD

It is a substantial and a speculative leap to make, but my contention is that the ideological force of the international consumer movement stems directly from the morality and ethics which activated the publication in 1961 of the American Standard. Across the developed world, individual disabled people and agencies acting on their behalf greeted it as a crucial breakthrough in the promotion of the cause of disabled people, and it became the model on which other national standards were based. There was the Canadian Building standards for the handicapped in 1965; the British Access for the disabled to buildings in 1967; the Australian Design for access by handicapped persons in 1968; the Swedish Regulations for access for the disabled to buildings in 1969, and others followed. Affected by the American model, what we find is that all these standards have prescriptions grounded in the self-help ethos; they became instruments which disabled people could deploy to fuel their cause.

My appraisal of the significance of the American Standard is seen from the perspective of a personal involvement with designing for the disabled which goes back to 1961, prompting the note that, in so far as documentation from the UK affords indicators of the moral and ethical bases for designing for the disabled in the UK, it is almost exclusively material which I have written or helped prepare. There was not, when I moved into the field in October 1961, any British documentation at all on architectural provision for disabled people in public buildings. Elsewhere in Europe, the only publication of significance was Muller's study of the
accessibility to disabled people of the buildings in the Stockholm suburb of Stigdal (Muller, 1961). As it happened, there was not in 1961 the opportunity for me to construct within the parameters of the British social welfare culture any independent design ideology on macro-environmental provision for disabled people, since among the participants of the first conference I attended, at Stockholm in October 1961, was Professor Nugent of the University of Illinois, who brought with him the draft of the 1961 American Standard. There is the speculation whether, had not America pioneered this strategy, any of the social welfare countries might have developed standards based on different cultural values; perhaps Sweden might have done so, but the evidence of the report of the Stockholm conference (SVCK, 1961) does not indicate probability (6).

The Nugent ethic

During the 1950s Tim Nugent, as director of the Rehabilitation Education Center on the Champaign Campus of the University of Illinois, developed a dynamic rehabilitation program, bringing to the campus many severely disabled young people who could benefit from the unique facilities he had established. His immediate concern was with the realization of opportunities for his students, but his vision was global. In a paper which he presented in November 1965 at the National Institute on Architectural Barriers (Nugent, 1965, p4) he said:

Physical and architectural barriers, or the inaccessibility of buildings and facilities and public transport, stand in the way of total rehabilitation. They stand between the disabled and their goals. They stand between the disabled and society.

Although there are other problems, the one that is presently enemy number one is inaccessibility. In spite of forward moving programs of physical restoration and rehabilitation, professionals in the field of rehabilitation are finding it very difficult to project clients into normal situations of education, recreation, socialization and employment because of architectural, man-made barriers.

There is overwhelming evidence that it is far more practical and economical to invest in the total rehabilitation of individuals with severe permanent physical disability so that they may become self-sustaining, contributing members of our society than it is to maintain them, in part or whole, via welfare programs of our states and nation. Given the opportunity for normal employment, they repay, in income tax alone, many times the cost of constructed rehabilitation programming.

We are basically concerned with making it possible for the great talents and resources of millions of physically disabled individuals to be put to use for the betterment of mankind by the elimination of architectural barriers.

The American Standard Specifications

In May 1959, Nugent had been among a group of individuals interested in attacking the problems of architectural barriers who had met with personnel of the American Standards Association (as it then was) to formulate the program, co-sponsored by the President's Committee on Employment of the Handicapped, which led to the issuing in 1961 of the national standard. Nugent was secretary of the steering committee, and a grant was awarded to him to undertake a program of research and development. He reported (1965, p8):

Structured research included more than 400 physically disabled men and women as subjects. They ranged in age from 14 to 45. They ranged in height (standing) from 4ft 2in to 6ft 6in. They ranged in weight from 80lb to 252lb. They included almost every cause and manifestations of physical disability.

A study was undertaken in connection with the program on the design of wheelchair kitchens (McCullough and Farnham, 1960). Of the 26 women who were subjects for the research, 20 were from the university campus and 6 from the community, 12 were in the 20-30 age group, and 21 were disabled as a consequence of polio. Thus it was that the physical characteristics of a group of trained and motivated young people predicated the practical specifications which went into the 1961 Standard; these specifications were sustained in 1971 when the Standard was reaffirmed, and were largely retained, with additional material, in the revised edition issued in 1980 (ANSI, 1980), for which Professor Nugent was chairman of the ANSI Committee.
The guiding precepts in the formulation of the specifications were normalization (equal treatment) and independence. The normalization prerequisite was that the specifications should be norms which accommodate the disabled as well as the able-bodied, so avoiding any need for segregated or special facilities. On the 'no special facilities' principle, Nugent said (1965, p10):

I sometimes hate the use of the word "special". There is nothing so special about planning buildings and facilities so that they would be accessible to, and usable by, all of our citizens. Someone had to conceive of, design and build, steps so that you and I could enter particular buildings. We would have looked ridiculous had someone not accounted for this prior to our attempting to enter. Those physical barriers that exist, are often most hazardous and detrimental to the so-called general public. The only thing "special" about this whole scheme of things is that it is relatively new in its total format. It will, in the relatively near future, be taken as much for granted as we take the wheel.

On the ethos of independence, Professor Nugent was equally uncompromising (1965, p10):

'Help' is sometimes shortlived and anything but a comfort to the individual with a disability. All of us require help from time to time. We can generally identify this need for help, because of specific circumstances at a particular time. We do not receive help, or seek help, because we are red-headed, bald-headed or have some other distinctive physical quality. In the same manner, the disabled should not be accorded help, nor should they seek help, merely because they are disabled. The objectivity of the situation, and the circumstances which surround it, should determine whether or not help is appropriate.

The self-help ethic was affirmed in 1967 with the official report of the National Commission on Architectural Barriers to Rehabilitation of the Handicapped, Design for ALL Americans (Rehabilitation Services Administration, 1967); it was perhaps symptomatic that among the 21 illustration in the report showing people in wheelchairs, only two have an attendant with them. An interesting comment on the ethics of the barrier-free movement in the 1960s is that nowhere in the Nugent presentation or in the National Commission report do we find the word "rights" or the word "entitlements"; the appreciation is that the movement was initiated on an ethic of challenge, opportunity and enablement, and not of rights. Nugent, one suspects, with his challenge "Let us begin to work with, not for or on individuals with physical disabilities" (1965, p10) would not have aligned himself with the rights movement, with its adversarial posture and its claim that only disabled people should be spokespersons on behalf of the disabled.

It is in the regulations of the Architectural and Transportation Barriers Compliance Board (the Board, 1981) that the design-for-the-disabled ethos of "militant advocates" is discernible (7). But in an examination of the ethical bases for design formulations it is the American Standard which is historically important. It has been backed by the US Government (8), and has been widely incorporated in state statutes - on a recent count (reported in Raschko, 1982, p336), 32 of the 50 states have adopted it in whole or in part to regulate the design of public buildings. It is as a consensus instrument that the Standard can be appraised, and its axioms compared with practices in Britain.

**BARRIER-FREE PRESCRIPTIONS AS A REMEDIAL FORCE**

Behind the preparation and promotion of the American Standard there is the powerful conviction that barrier-free prescriptions can be a vital remedial force for the alleviation of the difficulties of people with disabilities (Nugent, 1965, p4). There are two important ethic-linked facets of this stance: first that the therapeutic attack is on the macroenvironment rather than the microenvironment of disabled people, and second, that the focus is on physical rather than social remedies.

The focus on the macroenvironment

The ethic of the barrier-free movement manifested in the American Standard in its focus on the macroenvironment rather than the microenvironment is unique - not merely in respect of designing for the disabled but across the whole spectrum of interventions for assisting disabled
people. Historically, orthodox therapy has always been microenvironmental, meaning that remedial action, in medicine, welfare, employment, education, housing, transport, equipment and so on, has always been concentrated on individual disabled people, or discrete groups of the disabled. To radically shift the orientation of therapeutic action to the macroenvironment - embracing the whole physical world and bringing into the scenario the entire population - was a remarkable and imaginative revolution.

It was idealism of a kind which, I suspect, could only have been conceived in the self-help culture of the United States and a doctrinal leap which the social welfare culture of Britain, with its caution and pragmatism, would not have embarked upon of its own accord.

The reliance on physical interventions

The second facet of the barrier-free design doctrine, related to the first, is the reliance on physical rather than social interventions. For the self-help culture, a remedial merit of barrier-free prescriptions is that there is no scent of patronage, condescension, charity or philanthropy. The design ethic, epitomized, for example, by automatic-opening doors, telecommunication devices for the deaf and electronic guidance devices for the blind, is that the disabled person can manage independently and is not reliant on the help of an attendant.

THE AXIOMS OF BARRIER-FREE SPECIFICATIONS

Associated with the doctrine of the remedial efficacy of barrier-free environments, the specifications of the American Standard display two moral axioms. These are first, the goal of normalization and non-discrimination, and second the moral status of independence.

I use the term "normalization" here with diffidence, since in the field of services for the handicapped it is firmly associated with the work of Wolf Wolfensberger, relating to programs which counter the devaluation of handicapped people. "Normalization" as used in this paper has to do with the mechanics of the built environment; it relates to programs which normalize people with disabilities. Normalization involves implementing norms (of technical requirements for buildings) accommodating both the able-bodied and the disabled, so avoiding the stigmatization of special or segregated facilities. Interestingly, in an article The normalization principle, and some major implications to architectural environmental design (Bednar, ed, 1977, p135), Wolfensberger does not examine the mechanical dilemma which is the concern of this paper.

Normalization and non-discrimination

The customary rule for the determination of functionally efficient design solutions - measures of statistically normal distributions and standard deviations - is illustrated in Figure 1. Normal people in the centre are accommodated, and abnormal people at the tail ends are excluded. By definition, disabled people who are handicapped by conventional design arrangements in buildings are tail-enders, and there is therefore discrimination against them. The moral and ethical issue is whether, in order to remove the discrimination, designers should seek to extend normal parameters, or opt for discriminatory special treatment.

The normalization prerequisite of the American Standard was that the specifications should be universally valid solutions. It is not a doctrine which is sustainable; the data presented in Figure 1 indicate a variety of practical situations where conflicts can occur, and where compromise solutions may not be satisfactory. And, aside from the inadmissibility of the proposition that what is convenient for disabled people will be convenient for everyone, there is the difficulty that for a variety of design specifics - for example, vertical access, the location of elevator controls and the specification of floor finishes - there will be opposing criteria among different groups of disabled people.

In the specifications of the American Standard a determined attempt is made to sustain the principle of normalization, with, for example, requirements that telephones and lift controls are not to be higher than 54in (1370mm) above floor level. But concessions have to be made, in respect of such fixtures as lavatory basins and drinking fountains; the compromise is that supplementary provision for wheelchair users is admitted, with instructions of the kind "A reasonable number, but always at least one, shall comply with".
Figure 1 Dimensional data relating to activities in public buildings and in the home

<table>
<thead>
<tr>
<th>W</th>
<th>1190</th>
<th>1330</th>
<th>1365</th>
<th>1400</th>
<th>1435</th>
<th>1470</th>
<th>1505</th>
<th>1540</th>
<th>1575</th>
<th>1610</th>
<th>1645</th>
<th>1680</th>
<th>1715</th>
<th>1750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye level for sight-lines, mirrors, elevator controls etc, signage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>1360</td>
<td>1620</td>
<td>1660</td>
<td>1700</td>
<td>1740</td>
<td>1780</td>
<td>1820</td>
<td>1860</td>
<td>1900</td>
<td>1940</td>
<td>1980</td>
<td>2020</td>
<td>2060</td>
<td>2100</td>
</tr>
<tr>
<td>High level diagonal reach for storage, bookshelves, elevator controls, window furniture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>700</td>
<td>760</td>
<td>780</td>
<td>800</td>
<td>820</td>
<td>840</td>
<td>860</td>
<td>880</td>
<td>900</td>
<td>920</td>
<td>940</td>
<td>960</td>
<td>980</td>
<td>1000</td>
</tr>
<tr>
<td>Kitchen work surfaces comfortable level for food preparation etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>740</td>
<td>800</td>
<td>820</td>
<td>840</td>
<td>860</td>
<td>880</td>
<td>900</td>
<td>920</td>
<td>940</td>
<td>960</td>
<td>980</td>
<td>1000</td>
<td>1020</td>
<td>1040</td>
</tr>
<tr>
<td>Wash hand basin comfortable rim level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>730</td>
<td>510</td>
<td>525</td>
<td>540</td>
<td>555</td>
<td>570</td>
<td>585</td>
<td>600</td>
<td>615</td>
<td>630</td>
<td>645</td>
<td>660</td>
<td>675</td>
<td>690</td>
</tr>
<tr>
<td>Doors comfortable opening width in non-busy environments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The measures listed are drawn from the evidence of relevant anthropometric studies (10); they are not presented as definitive data and should be regarded as reasonable approximations for purposes of illustration.
The consequence is that the normalization precept is breached, with the recognition that, in certain particular circumstances, there has to be special treatment. In the regulations of the Compliance Board (1981, pA16 and A18), the ethical dilemma is resolved by the application of the 'rights' principle of affirmative action (positive discrimination), with minimum requirements being prescribed for accessible spaces in parking lots and viewing positions in assembly areas. (The American Standard, it may be noted, does not confront this issue; it limits itself to technical requirements, leaving scoping provisions to administering agencies. For the Compliance Board with its rights ethos the issue of scoping was crucial, and it was the requirements of the 1981 regulations for all entrances and toilet rooms to be accessible that were the subject of controversy (7)).

In Britain, with its social welfare culture, the clear understanding is that special treatment is proper: special telephone and toilet facilities are, for example, designated for wheelchair use, and are overtly different from normal provision.

The moral status of independence

The second axiom perceived in the American Standard is the moral status afforded to independence. It is epitomized in the specifications for wc compartments, where the presumption is that the disabled person will have been trained to manage independently, and will not require an attendant to assist.

If a wc compartment is to cater for the broad range of wheelchair users, it needs to be planned so that transfer (with or without assistance) from the wheelchair to the wc seat can be frontal, diagonal or lateral, indicating a compartment width of about 1500mm (5ft 0in). In the 1961 American Standard, the requirement is that "toilet rooms shall have at least one toilet stall that is 3ft wide", and "is at least 4ft 8in, preferably 5ft, deep" (ASA, 1961, p 10).

For a chairbound person to transfer to a wc seat in a compartment only 3ft (760mm) wide, and which may not be deep enough for the door to be closed behind him, a degree of "functional training" is required which is in the realm of gymnastics. Severely handicapped people are, as Steinfeld (1977, p82) notes, excluded. The 1980 revision does offer a preferred alternative permitting lateral transfer, but the 3ft compartment is still retained as an option for wheelchair users. There is no mention in either the 1961 or the 1980 Standard of the desirability of incorporating in public buildings a unisex wc compartment.

For comparison, the British code Access for the disabled to buildings (BSI, 1967, p 27) advised a width of 5ft 0in. This recommendation drew on the evidence of a study (Goldsmith et al, 1966) of 19 disabled subjects. The United Nations Expert Group Meeting report (1974, p32) in an analysis of norms in 17 countries, records that for wheelchair compartments the least width advised was 1500mm; a curiosity is that for the USA the North Carolina State Building Code is cited, which advises a width of 1650mm. The 1979 British code (BSI, 1979, p6) recommends a wc compartment size of 2000 x 1500mm, and also notes (p5) "The preferred facility ... is one which incorporates a wc compartment serving both sexes, allowing for example a husband to help a disabled wife or vice versa".

The ethical issue is not whether disabled people should be rehabilitated to manage independently, but whether designers should endorse the proposition that they should only cater for those who can cope independently, and exclude others. In the Norwich survey of the late 1960s (Goldsmith, 1976, Section 12) there were, among the 279 people in the total wheelchair population, 77 people (27%) who used buildings and were not ambulant; of these 77 there were 6 who when they used buildings did so independently. And among the 279 people with wheelchairs, there was only one who was chairbound as a consequence of paralysis caused by an accident. It may have been the case that the population was not typical, and it could well be that a similar survey undertaken today would yield quite different findings (11). What can be is that in any wheelchair population, in Europe or America, there will among those who are not ambulant be a substantial proportion who in their use of wcs are dependent on an attendant for assistance.

The reliance on the criterion of wheelchair independence which determines the specifications in the American Standard does not, aside from the planning of wc compartments, exclude people in wheelchairs who are assisted. There is, however, a related comment regarding elevator controls, where, in order to
cater for independent wheelchair users, the requirement is that no control is higher than 54in (1370mm) above floor level. A pertinent query is whether controls fixed at this level discriminate against handicapped people, in that there will be more short-sighted ambulant people who are gravely disadvantaged than there will be wheelchair users for whom the prescription is positively critical.

The recommendation for 3ft wide wc compartments for wheelchair users stems from the Nugent ethos of enablement and challenge which influenced the 1961 Standard. In the intervening years there has been the emergence of the rights movement, with its principle that only disabled people should advise on the interests of the disabled (12). A query is whether consumer advocates might favour more generously sized wc compartments to cater for those of their membership who need personal assistance. In Britain, where leading advocates of the consumer movement (as in the United States) tend to be independent wheelchair users, this would appear to be the case (13). In the United States, the recommendations of the Compliance Board (ATBCB, 1981, p42) do not confirm that this occurs: there is a marginal concession only, that where alterations are made to existing facilities (not in new construction) "the addition of one unisex toilet per floor will be acceptable in place of making existing toilet facilities for each sex accessible".

THE PARAMOUNCY OF THE WHEELCHAIR USER

In the examination of the practical implications of the axioms of normalization and independence, the discussion has focused exclusively on wheelchair users. Reverting back to the Nugent ethic and the formulation of the American Standard, the hypothesis is prompted that there was an overriding commitment to the normalization of the independent wheelchair user, and that this became a moral imperative to which competing design criteria are subordinated. The battalions of people with ambulatory usabilities, sight disabilities, hearing disabilities and disabilities of incoordination (14) were, one suspects, troops of lesser rank, enlisted to give logistical support to the wheelchair brigade.

Measures of building handicap

On measures of "building handicap" the wheelchair user has a unique status. Where in their use of buildings other people with disabilities - for example the blind or the deaf - are simply handicapped by their disability, the wheelchair user is handicapped three times - by his disability, by having to operate at a lower level than normal standing people, and by having to use a cumbersome and space-consuming vehicle for his mobility. On account of his dependence on his wheelchair, he frequently encounters environmental situations where potentially there is failure to cope (such as steps in front of buildings, narrow doors and small elevator cars), but where there need not have been had the architect anticipated the difficulty and avoided the confrontation. Ambulant disabled people rarely encounter these situations, and sight-impaired and hearing-impaired not at all; there is therefore enormously more scope for architects to alleviate the environment handicaps of wheelchair users than there is those of other people with disabilities (15).

When we examine, in respect of typical activities in the home and in public buildings, the status of disabled people in relation to customary design parameters (Figure 1), we observe that ambulant disabled people will almost invariably take positions close to the norms of all users, whereas wheelchair users are isolated outsiders. The ethical base for the barrier-free movement was, as has been noted, an idealistic conviction (accompanied by a doctrinal disregard for practical obstacles) that the gulf could be bridged. It was essentially a bridge for wheelchair users to cross, and in the process, as we have observed, for example, in respect of the height of elevator controls and telephone appliances, it may in its realization exacerbate the handicaps of other disabled people.

BRITISH COMPARISONS

The preceding commentary has concentrated on the moral and ethical values underlying the specifications of the American Standard. The thesis is that the international barrier-free movement is ideologically an American product, which, by means of related national standards based on the American model, has been transposed into other cultures, among them Britain. In the transition process
cultural modifications occur, as has been evidenced with the planning of wc compartments. Predictably also, there will be differences in the means of implementation - in Britain, for example, there is a preference for education and exhortation to effect change, rather than legislation and regulation.

Codes of practice

The codes of practice issued by the British Standards Institution have equivalent status to American standards; they are voluntary consensus standards which can be given mandatory force by reference in legislation and regulations. The principal difference between the 1967 British code and the 1961 American Standard (manifesting pragmatism versus idealism) was that, instead of a single set of technical requirements, the British code had one set of prescriptions for chairbound disabled people and another for ambulant disabled people. The rationale is explained in Goldsmith (1967, para 6013):

The distinction between the ambulant and the chairbound is needed because there are circumstances where conflicting criteria may occur... and it is also the case that for practical reasons it is impossible to make all areas of buildings accessible to chairbound people.

The intention was that the general recommendations of the 1967 code would be followed by supplements specifying scoping requirements for different types of buildings, but in the event this was not achieved.

The 1979 revision of the British Code came into line with American practice with, for the sake of simplicity, a single concise set of technical requirements based principally on wheelchair-user criteria. The Code was drafted so that it could subsequently be incorporated in national building regulations, which, it was anticipated, would prescribe scoping conditions for different types of buildings by reference to relevant recommendations of the Code.

In 1979 the BSI code of practice was revised and reissued (BSI, 1979) in a simplified and more coherent form with recommendations covering the requirements of both wheelchair users and ambulant disabled people. The drafting of it was on the basis that it could subsequently be incorporated in the national building regulations.

Legislation

The Chronically Sick and Disabled Persons Act 1970 (section 4), required that all new public buildings should be accessible "in so far as it is in the circumstances both practicable and reasonable". The qualifying clause, manifesting the social welfare culture of caution and expediency, was a cause of irritation to consumer advocates, who complained that the legislation "lacked teeth" (16). There was also the impediment that there were no sanctions attached, meaning that developers could, if they wished, ignore the intention of the Act (17).

The Disabled Persons Act 1981 amended section 4 of the 1970 Act, with a positive requirement (in section 6) that access provision be made in public buildings, subject to the determination of a statutory body to be appointed. Following consultations on who this body might be and how it might operate, the understanding now is that section 6 will not be activated, and that instead access requirements will be incorporated in building regulations, with scoping provisions referenced to the code of practice.

The National Building Agency survey

While, by comparison with American legislative and regulatory practices, British procedures may seem weak, they can achieve satisfactory results. To check on the effectiveness in practice of the 1970 legislation, a survey was undertaken during 1979 by the National Building Agency (the Agency, 1979) of a sample of 53 public buildings. These comprised a range of building types, 24 having been funded publicly and 29 privately. The survey examined how far the provision for disabled people conformed with the recommendations of the 1979 Code, which was then in draft. Among the findings were that the 34 buildings in the sample completed since 1975 all had satisfactory access provision, and the 11 buildings completed since 1977 were accessible in all areas.

Analysis of the survey findings indicates that, while the important recommendations for approach, access and internal circulation were generally observed, the performance on supplementary considerations (such as the specification of door
closers, handrail design and parking provision) was less satisfactory. Among provisions overtly manifesting ethical values, the most significant predictably, was the unisex wc compartment, which was the normal provision where lavatory accommodation was provided for disabled people.

Also of relevance in the context of the value of independence is the gradient of ramps: the findings indicate that 20% of access ramps were steeper than the recommended gradient of 1 in 12. Interestingly, the British Code does not, like the American Standard, prescribe a maximum rise for a ramp; the implication is that it is not critical that access is obtained independently. Perhaps also betraying the social welfare ethic is the finding that there was cursory regard for signposting the availability of suitable facilities for disabled people, expressing, it might seem, a hopeful confidence that disabled people would somehow be able to find their way around.

TRANSPORTATION AND HOUSING

To a greater extent than in programs for public buildings, it is in housing and transportation provision that ethic-based differences between the US and Britain are observable.

Transportation

The legislative base in the US for barrier-free transportation is the 1970 amendment to the Urban Mass Transportation Act, stating that it is "the national policy that elderly and handicapped persons have the same right as other persons to utilize mass transportation facilities and services" (Cannon and Rainbow, 1981). The normalization and non-discrimination principle was displayed in the construction of the Washington Metro and the Bay Area Rapid Transit system, and in the design program for the ambitious Transbus project, which eventually failed in 1979 on account of technical and economic problems (Office of Information and Resources for the Handicapped, 1979, p9).

In Britain there has not been the same doctrinal stance on the design of transport systems. There has never been serious debate in Britain about the desirability of comprehensively accessible buses, or about making the London underground accessible; in his report on the use of the underground system by people with impaired mobility, Penton (1976) proposes cosmetic improvements only, and does not advocate any restructuring of the basic infrastructure. The Department of Transport in its guide to transport for disabled people (1981) catalogues the variety of services available; there is pragmatic social welfare reliance on, for example, cash benefits to disabled people for mobility needs, concessionary rail and bus fares, special parking entitlements, and local dial-a-ride transit services using small buses or taxis.

The London taxi

The prototype for a standard new London taxi, programmed to replace the familiar black cab, has been designed for wheelchair accessibility (Forrester, 1982). This is an imaginative program sponsored by the UK Department of Transport; interestingly, there was not at any stage in the design process the proposition that wheelchair access might be undertaken independently - it was always understood that the wheelchair person might need a push or a shove to get in.

Housing

The American Standard in its 1980 revision includes an extended section on housing, with specifications for "individual accessible dwelling units" (ANSI, 1980, p52). Based on the design principle of adaptability, the concept displays an idealistic ethic of comprehensive coverage with wheelchair paramouncy, and an allegiance to physical rather than social interventions. In consequence, space and amenity standards are substantially superior to those for normal subsidized housing; they correspond to the requirements for purpose-designed housing for disabled people in Britain, known as wheelchair housing (Goldsmith, 1975).

In Britain, public housing caters largely for general family needs, and is not particularly the domain of special-needs groups such as the poor, the elderly and the handicapped (18). Local authorities do, however, have a particular concern for the needs of disabled people, and the customary solution used to be the provision of wheelchair dwelling units (19). With the widespread provision in recent years of "mobility housing" the orientation has, however, shifted.
Mobility housing

The governing precept of mobility housing is that it is ordinary housing, designed to prevailing public sector parameters of space, amenity and cost. At the same time, it is geared to accommodate the needs of the great majority of handicapped people, the primary condition being that there is not the need to negotiate steps or stairs. I worked on the formulation of the concept for the Department of the Environment in 1973-74 (Goldsmith, 1974, see also Goldsmith, 1978). It is in line with the barrier-free philosophy, and would not have been realized had there not already been the model for public buildings of the American Standard; its design principles were subsequently detailed in a British Standard (BS1, 1978).

Ethically, mobility housing manifests the principle of normalization and macro-environmental therapy. At the same time, it evinces a pragmatic rather than an idealistic philosophy, and it does not assert wheelchair paramouncty. Dwelling units planned to mobility standards will accommodate the large proportion of the wheelchair population who are not chairbound, but it recognizes that for those who are chairbound - and who need additional space and special kitchen and bathroom facilities - there is a need for special treatment in the form of wheelchair housing.

A related development is that of integrated housing, the principle being that in the planning of any housing scheme which incorporates units suitable for disabled people, all other dwellings should be accessible, permitting disabled people to visit their neighbours (Summers, 1981).

Physical and social considerations

A culture-related factor affecting housing programs for disabled people in Britain is that physical remedies may not of themselves be effective. It commonly occurs that disabled people who have the opportunity to move to a purpose-designed dwelling unit decide to stay where they are; they prefer their existing dwelling with its inconveniences, because there is the important advantage of remaining in their established community, with support from neighbours, friends, shopkeepers and others (20). In recognition of this factor, housing programs for disabled people are increasingly concentrated on house adaptations rather than new-build provision, occasioning of necessity a design ethic of pragmatism and ad hoc modifications (21).

Perhaps because the designer can respond to the personal wishes of his client, house adaptations are commonly more successful than new-build wheelchair housing; in Living Independently, Ann Shearer (1982, p103) reports that of the six dwelling units housing the nine severely disabled people she studied, the least satisfactory was one of the two which had been purpose-designed.

Among American literature on barrier-free environments, there is one admirable (to my mind) publication which displays a different ethic from the customary mechanistic approach. In Design for Independent Living, Lifchez and Winslow (1979) report the project they undertook with clients of the Centre for Independent Living at Berkeley. It was, they record, a consciousness-raising experience for all, and they say (p16):

given the opportunity everyone, disabled or not, would prefer a lifestyle that offers not only choices but also a sense of belonging, that is, a sense being a meaningful part of all that is taking place in any physical location. Making this happen for disabled people requires an understanding of their environmental needs that goes beyond meeting government regulations, building ramps, or adapting bathrooms and kitchens.

The paucity of empirical evidence

This paper concludes not with an evaluation of the respective merits of the self-help and social welfare design-for-the-disabled ideologies, but with a plea to researchers for sound, relevant and informative empirical evidence which will illuminate for architects and designers the practical business of designing for the disabled. There is a need for substantive evidence regarding, for example, the extent to which disabled people are actually handicapped by the public buildings they use (or would like to use) and the homes in which they live; which facilities (or lack of facilities) are of most acute concern, and what kind of alleviations are most desirable.

The kind of enquiry I have in mind is that which I undertook in Norwich, England
between 1964 and 1968, whose findings are reported extensively in the third edition of Designing for the Disabled (Goldsmith, 1976, section 12). This was an examination of the wheelchair population in the city, looking at their use of public buildings and how they managed in their homes. There has not since then, either in Britain or America, been any equivalent population study which has intensively examined a reliable sample of the "handicapped-by-buildings" disabled population and informed us about its characteristics, behaviour, problems and performance.

Housing evidence

A variety of local population studies have been undertaken in Britain on housing provision for disabled people; of note are Hunt and Hoyes (1980), Finlay (1978) and Buck and Hibberd (1982).

In the US, so far as I can ascertain, evidence is more sparse. Lifchez and Winslow give informative accounts of the living environments of seven disabled people. Laurie (1977, p297) reports a postal survey of 250 members of the Massachusetts Association of Paraplegics undertaken in 1965-66, and in Raschko (1982, p200) there is an account of a study from Minneapolis of kitchens for disabled and elderly people, drawing on a sample of 114. Steinfeld et al (1979 (2)) report a study of 200 disabled people at Syracuse University, which focused on equipment and physical facilities in the home.

Public buildings evidence

There is, to my knowledge, no recent population study, either in Britain or America which has examined the use of public buildings by disabled people. Steinfeld et al (1979 (1)) made an exhaustive study of literature relating to access to the built environment; they report no reliable relevant population studies, and record (p27) "Unfortunately, no demographic study, to date, has used measures of functional abilities in a manner that would provide a full set of statistics". In England, Buchanan and Chamberlain (1978) made a survey of the mobility of 95 unrepresentative arthritic people in Leeds, and Thomson (1979) in a survey of 166 selected handicapped people in North London was able to report only anecdotal evidence.

The need for evidence

This paper has sought to examine the moral and ethical bases for designing for the disabled, concentrating in particular on the ideology underlying the formulation of the American Standard for accessible buildings and facilities. Whether or not they endorse this (or an alternative) ideology, architects and designers ought, I suggest, to be constantly reviewing and assessing the moral and ethical bases for the design decisions they make. To assist them in this process, they need evidence to guide them, of a kind which calls in particular (though not exclusively) for the skills of the social psychologist. It would be gratifying if, as an outcome of the presentation of this paper and the issues it has raised, members of the Environmental Design Research Association could be agents for action.

FOOTNOTES

1. For commentaries on the policy switch from the invalid tricycle to the mobility allowance. See Sharp (1974) and DHSS (1974).


3. See, for example, the illustration on the front cover of the September/December 1981 issue of the journal Design for Special Needs (London: Centre on Environment for the Handicapped).

4. See, for example, the reports of the official commissions on access (Large 1979) and discrimination (Large, 1982), which were comprised predominantly of consumer representatives.

5. There is an abundance of literature, but see, for example, the chapter on Access as a civil right in the official report to the US Department of Housing and Urban Development on the programme leading to the 1980 revision of the American Standard (Steinfeld et al, 1979 (1), p9).

6. The report of the conference (SVCK, 1962, p166) lists the responses from agencies in 19 countries to the
question "Is any special committee or organisation in your country working on the problems of community planning from the viewpoint of the handicapped?"; among these (aside from the US) none mentioned that the idea of national standards had been considered.

The Board had a mandate to develop guidelines and requirements for Federal buildings, and its regulations as first issued in 1981 (ATBCB, 1981) required that all entrances and toilet rooms should be accessible, along with a variety of other rigorous provisions to assist wheelchair users - the regulations were subsequently revised (ATBCB, 1982) with less stringent requirements. On the 1981 regulations, Timothy J Clark (1981, p221) commented that "From a tenuous start... the Board has evolved into an agency whose members and staff are composed predominantly of militant advocates of benefits for the handicapped", and that "To the board, the Architectural Barriers Act that it enforces is not so much a law authorizing reasonable standards of construction as it is a broad civil rights statute demanding that people in wheelchairs be able to go wherever other people go."

8. The foreword to the 1980 revision of the American Standard (ANSI, 1980, p3) records "In 1974 the US Department of Housing and Urban Development joined the Secretariat (of the ANSI committee) and sponsored two years of research and development to revise the standard and extend it to include residential environments".

9. For an extended commentary on the conflicts between the design requirements of wheelchair users and others, see Goldsmith (1976, 1111 - 1117.)

10. The measures given are derived from the data presented in section 20 of Goldsmith (1976) which cites sources; the note is made (para 2022) that it is impossible to obtain reliable anthropometric information relating to wheelchair users.

11. Information communicated personally by an officer in the social services department of Norfolk County Council is that there are now (February 1983) five people in the city of Norwich (which has a total population of 120,000) who are paraplegic or quadraplegic as a consequence of accidents; there is no information on the present size of the total wheelchair population in the City.

12. The views of consumer representatives on the planning of toilets are reported in the CEH seminar report on public lavatories for disabled people (1978).

13. For a report on the principles of the rights movement, see, for example, the article Disabled Peoples' International (Laurie, ed, p33), in the 1980 issue of Rehabilitation Gazette.

14. The allusion here is to para 1.1.2 of the American Standard (ASA, 1961).

15. For amplification of this assertion see the paper The Built Environment - Who does it handicap? (Goldsmith, p15) and Methodological problems in the research process (Goldsmith, p79) in Proceedings (Swedish Council for Building Research, 1982).

16. See, for example, the report of the Silver Jubilee Committee on improving access for disabled people (Large, 1979, p43).

17. For an example of an unsuccessful attempt at enforcement through the courts, see Goldsmith, 1976, para 1407.

18. Currently in Britain some 31% of the housing stock is owned by public authorities.

19. Section 3 of the Chronically Sick and Disabled Persons Act 1970 required that local housing authorities "shall have regard to the special needs of chronically sick or disabled persons"; this was widely interpreted as a mandate to build purpose-designed wheelchair units.

20. Bristow (1982 p41, 60) cites evidence on the reluctance of disabled people to move from their existing homes.

21. See, for example, the report by Cheshire county architects department (1973).
REFERENCES


Department of Transport. Door to Door, a guide to transport for disabled people. London: the Department, 1981.


Hunt, John and Hoyes, Lesley Housing the disabled. Torfaen, Wales: Torfaen Borough Council, 1980


Large, Peter (Chairman). Report by the Committee on Restrictions against Disabled People. London: Department of Health and Social Security, 1982.


Steinfeld, Edward. Developing Standards for accessibility. In Barrier-Free Environments (Bednar), 1977


ABSTRACT

This paper proposes a framework for evaluating accessibility features that have been incorporated in new buildings or retrofitted in existing ones. The guidelines are based on detailed observations and evaluations of accessibility provided within recent years in public buildings owned and operated by the federal Canadian government.

The evaluation objectives focus not only on safety, functional ease and technical accuracy, but also on the operational requirements, the attitudes that are reflected by the solutions provided and the visual impact they have. Many of the accessibility provisions observed to date are far from satisfactory in view of the proposed evaluation guide.

Therefore the conclusions reached are that if these issues are to be addressed appropriately, much greater comprehension must be developed on the part of the designers regarding the intent of barrier free standards, their degree of implementation, and how they affect and relate to disabled and able-bodied users.

INTRODUCTION

The objective of this paper is to present criteria considered essential in evaluating the quality and usefulness of handicap-accessible features in public buildings, criteria which go beyond the purely technical assessment of building accessibility to focus equally on its psychological, social and visual aspects. The development of these criteria was based upon detailed observations of accessible provisions, carried out in twenty-two old and new buildings that are under the jurisdiction of Public Works Canada.

This federal ministry, responsible for over 3000 buildings across Canada (buildings serving the public and office buildings) is in the process of implementing a recent policy to make the majority of the buildings accessible within a five year period. The ministry has developed their own Barrier Free Design guidelines (Public Works Canada, 1980) and since then have begun the modification program in earnest. (New construction built after 1975 already respected the Canadian National Building Code requirements for accessibility.)

As part of this initiative, in the summer of 1981 they contracted me to evaluate some of the recent projects carried out in Montreal and Ottawa, and based on my findings, to propose an evaluation framework which they could apply to subsequent work. My approach was not to study plans and specifications, nor fill out long checklists about what did or did not exist, but simply to observe and use the accessible features, to question administrators and users of the building, and to sense and perceive my reactions to it all.

I had been particularly selected to do the study because I have both personal and professional experience in the field, and therefore I would like to present my credentials for it:

I have been an architect for 17 years -- designing, consulting, criticizing, learning, observing;
for 13 of those years, I have been in a wheelchair -- learning new ways, experiencing barriers and frustrations, dealing with misunderstanding and segregation;
for 8 of these past years I have specialized in policies, programs and solutions related to accessibility of the built environment;
and for the last 5 years I have also been a professor of architecture -- transmitting to students not only the notions of good design but also the full human context in which architecture should be conceived.

Therefore, my approach to the evaluation process includes various viewpoints, which I would like to elaborate as the following:
1 - The practical view

My own needs for accessibility are immediate, and I continually judge how they are satisfied on the basis of two primary characteristics: functionality and safety. These are essential qualities to which I react instinctively, because they directly affect my ability to circulate and maneuver around and within a building with independence, ease and security. Not only are these requirements primary to the satisfactory use of any environment, but the physical autonomy they bring is one of the prerequisites for liberating emotional and intellectual strength. For instance:

a) do I have to use my energy being patient rather than efficient?
b) do I have to go long distances when others travel a direct path?
c) do I get held up between doors and get angry?
d) am I at the back when all the action takes place at the front?

2 - The technical view

I check all features against my knowledge of the many codes, guidelines and design criteria that exist in North America (Mace, 1974, Lifchez, 1979, National Research Council, 1980, etc.) as well as those in Europe (Goldsmith, 1976). I am aware of the values, reasons and research which underly these codes and guidelines, but I am equally aware of the many assumptions that have been made in this process (many unfounded) and of the intellectual and rational thinking that has often been substituted for real, pragmatic experimentation. Through my own experience, I realize that many assumptions have been rarely tested or proven, or that others have been valid in the past but should be re-evaluated at present, since life-styles and life-values are in constant change.

Furthermore, I am continually surprised that design solutions to the same problem are handled differently in every situation. This poses questions such as:

a) are there too many codes, each one different?
b) does no one really understand them or apply them?
c) are technical people so uncomfortable with the subject that they cannot treat it properly?
d) faced with the requirement of "standards for the handicapped", do people lose their ability for logical thought?

At the same time, I am troubled by the reality that many important design criteria have still not been incorporated into the technical literature, which is predominantly oriented to the wheelchair user, and does not provide adequately for the needs of visually- or hearing-impaired persons, elderly persons, those with ambulatory or coordination limitation, and others. This brings up questions such as:

a) is there specific knowledge that can be used to expand these codes?
b) can the requirements be stated in a way that they can be interpreted easily and correctly?
c) can any concensus be reached on these subjects?

3 - The user view

As a disabled persons, I am inevitably conscious about how other persons perceive me in any situation or setting, and how they react to my effort to be as independent and appear as integrated as possible. This implies that in the process of using facilities that may or may not be accessible, or are partially so, I am continually verifying my emotions and reactions:

a) do I feel stigmatized?
b) do other people go out of their way to help me?
c) do I feel uncomfortable or insecure with the special features that have been provided for my particular use?
d) do I wish it had been done differently?

Inevitably these considerations intertwine with the practical and technical viewpoints, but in quite unpredictable ways. It is not always the most expensive solution (mechanical or "special use") that is the most useful, appropriate or appreciated, and design overkill in an accessible feature (very commonly observed) is often undesirable and unproductive. Though disabled, I am still a human, not a robot, and I prefer to use facilities (somewhat adapted, if necessary) that others use. Am I allowed to do that? (Lifchez and Winslow, 1982)

4 - The professional view

As an architect, I evaluate the design solution to the accessibility problem in terms of the attitudes and hidden messages that it implies, not only to me, but to users who may be less, or not at all disabled. This judgement is oriented toward considerations such as:
a) is it a logical solution?
b) does it make sense in the given context?
c) is it visually integrated?
d) how does it affect the esthetics of the rest of the setting?

Furthermore, I do not judge the accessibility situation only in relation to my own handicap, but as a professional with knowledge of many other handicapping situations, I simulate other disabled persons' reactions to the environment, to how safely and comfortably they could function within it. These include:

a) could they find their way in a particular architectural layout (horizontal and vertical circulation)?
b) would the decorative treatment (lighting, textures, colour contrasts) help or hinder them?
c) would they profit or suffer from the special equipment?
d) what specific aids would they need?

The preceding viewpoints begin to introduce the complex task of judging if, how, and for whom any built environment, with its endless variations of type, size and equipment, has been made accessible. How can the many persons with physical and sensory impairments, each with different limitations and abilities, having differing requirements as well as individual means of coping, be adequately accommodated? What are the specific environmental objectives we need to fulfill? What criteria can and should we apply? What does barrier free design truly imply?

THE MEANING OF ACCESSIBILITY - FUNCTIONALITY - SAFETY

The concept of barrier free design is a relatively new one, having emerged within the past ten years as an expansion of "design for the handicapped", which mainly addressed the mobility problems of wheelchair users. The enlarged view of the accessibility problem, though still strongly oriented towards the needs of disabled persons, has come to realize that many other users, generally considered able-bodied, suffer from the existence of a variety of often un-intentional man-made barriers, the result of lack of consciousness and knowledge . . .

In the best of all possible worlds, the aim would be to create a totally barrier free environment, one where no orientational, functional, visual, auditory, spatial or manoeuvring barrier would exist for any user of an environment . . . whether old, young, encumbered by packages, pregnancies, strollers, maintenance wagons, moving equipment . . . or whether they are among the many individuals who have a medically identifiable impairment that becomes a handicap when they are carrying out their daily activities. In such a world, many persons whom we consider able-bodied would worldlessly appreciate and take advantage of design features that facilitate the use of the environment and for everyone provide greater ease, safety and functionality.

However, to be realistic, at this stage of the accessibility evolution process, we -- architects, technicians, site planners, industrial designers and specialists -- do not even know which performance standards are valid and which design solutions to advocate. Nevertheless, having made some significant strides towards a basic accessibility, we have to face another reality: that is, that disabled persons as such (those with a medically identifiable impairment) will in different ways (special to them) always be somewhat different, and may require some help, despite their and society's efforts to achieve independence and autonomy. I do not view this as a negative fact, only as a practical one. Therefore, before embarking on specific aspects that should be evaluated, I wish to elaborate on the various kinds of help disabled people may need or ask for (these two are not identical, depending upon the individual in question). I have classified these in three categories:

1 - Help that comes naturally during a normal activity

Such help is not discriminatory to the person receiving it, nor hazardous to the person offering it; it is help that is naturally acceptable and generally polite: e.g., a door held open in a situation where people are continually walking in and out; a push up a ramp if it seems to cause strain; passing a paper towel in a busy washroom . . .

2 - Help that is offered without hazard

Though no hazard is involved, this type of help obliges the helper to make a special effort to accommodate the disabled person, which consequently makes the person helped feel uncomfortable: e.g., having someone open a locked door or operate an elevating device; having to use a
private phone because the public one is inaccessible; asking for permission of any kind . . .

3 - Help that is hazardous to one or both persons involved

Some type of help does present a danger to the person(s) helping and/or to the person being helped: e.g., hoisting up/down a curb, steps or staircase; pushing/pulling a wheelchair up/down a steep ramp; transferring someone to an inaccessible toilet . . .

In other words, the fact that one has to ask for any special kind of privilege, as in the second and third situations, focuses on "procedures" that must be taken. This in turn emphasizes the lack of "integration and equal participation" that still exists, and that denies disabled persons their rights as first-class citizens. Therefore, accessibility design solutions must respond not only to the prescribed standards, but must take into consideration their effect on disabled users as well as their able-bodied counterparts.

EVALUATION FRAMEWORK

The standard procedures for evaluating accessibility - usually in the form of checklists - tend to enumerate and define technically the accessible features that are provided in any one facility. (Access for All, 1977) That, of course, is the nature of checklists: the simplify and reduce elements to common denominators that can be quantified, but they do not provide a procedure that is broad and complex enough for assessing environmental performance. (Konecny (Falta), 1973)

Checklists view accessibility features as elements dissociated from the architecture and equipment found in and around a building; they do not qualify them in terms of operational, psychological, social or esthetic impact. However, if we are ever to achieve something resembling a barrier free environment for all, we will have to replace this narrow approach regarding "special features for the handicapped" (responding to the code but no more) by the broader concept that simple, integrated, visually and environmentally appropriate solutions do exist, and must be integrated into our design vocabulary for the benefit of all users.

Based on the foregoing reflections, the proposed evaluation guidelines incorporate a broad range of design considerations, including qualitative as well as logistic aspects:

1 - respect for design standards;
2 - respect for the context the building presents;
3 - flexibility in relation to design solution;
4 - user-related qualities as opposed to simple technical characteristics.

Many of the buildings evaluated were retrofitted for accessibility (mainly wheelchair use) and do not even pretend to rectify the many environmental problems that are the scope of barrier free design. Furthermore, the constraints found in existing buildings present much greater difficulties than would similar accessibility requirements in new buildings.

It was educational, as well as interesting to note, however, that in both old and new buildings many incongruities were observed that were not specifically related to existing size or location restraints. Many of the solutions proved inadequate, many inappropriate, some overdesigned, and in general they seemed to be illogical efforts to accommodate the "unknown, disabled being".

Based on this experience, one which kindled many reflections of attitudinal barriers and practical uncertainties, the evaluation framework was conceived to focus attention on the integration of functional, operational and esthetic qualities inherent to any effort to improve the practical characteristics of our environment. Since many criteria interact in the evaluation framework, the questions posed include the following:

1 - What kind of facility is it?

Does it provide a service to the public? (e.g., post office, employment office) or does it provide long-term employment? (e.g., mail sorting facility, customs offices). In some situations, these two functions overlap (e.g., National Film Board, Department of Revenue) and in others hardly at all (e.g., forestry department). In each situation, one must judge to which level accessibility requirements should respond: which areas must be totally and readily accessible; which areas require a lesser degree of accessibility? Can we honestly make a distinction? On what grounds?
2 - How are the accessibility features integrated with the non-accessible situations?

Do disabled persons have to use completely separate facilities, elsewhere, altogether away from the normal circulation and from other users? Are they obliged to find the one "accessible" toilet or entrance, or can they use the same one that others do, and still find it accessible? Are the accessible features located in an easily accessible place? (This may sound like a silly question, but it is truly unbelievable how often facilities such as handicap toilets and lower telephones are located in completely inaccessible settings.)

3 - How essentially useful is the accessible facility that has been provided?

Is the facility effective for the disabled user as well as the non-disabled user? In this consideration, cost-effectiveness is an important factor. The more users (of all types) that can really benefit from an accessibility features (e.g., cafeteria staff using service carts on a ramp; elderly, blind or uncoordinated persons using a handrail for support or guidance), the more that feature has an economic and functional value that reaches beyond the confines of "design for the disabled". Cost-effectiveness increases rapidly when it becomes a valuable and useable part of the built environment.

4 - How safe is the feature, and for whom?

What risk does it harbour for disabled persons (e.g., a uni-sex toilet where a disabled person is alone behind locked doors?) and for other users (e.g., a wall-hung, protruding fountain accessible to wheelchair users but hazardous to blind persons?) What about a short but steep ramp that may project a wheelchair too abruptly into a circulation path that may be at right angles to the ramp? This is a danger for passers-by and is very serious if it leads into vehicular circulation. In addition, the short, steep ramp may often be unstable and slippery for all users.

5 - Does it conform to standards, and to which ones?

Does the solution show an understanding of the intent of the standards? (e.g., why accessible unisex toilets in a workplace where a severely disabled person requiring a helper would normally choose one of the same sex? therefore why send autonomous disabled persons into a separate unisex toilet where they feel segregated from their co-workers?) Have the persons that interpreted the standards responded by applying too broad or too limited a range? (e.g., why provide special electric doors for the 'handicapped entrance', particularly in new installations where space is not a problem, when the design standard only requires a lightweight door closer and sufficient flat landing space on both sides of the door? why supply the special, expensive, hospital-type wheelchair basin when the standard only specifies accessibility under the basin and lever or cross-type faucets?) Is it a logical solution, a safe one, or over-kill?

6 - What is the perception of and the reaction to the accessibility features by disabled and non-disabled users?

Is the reaction negative when it appears too special (e.g., the hospital wheelchair basin), too ugly (why does it have to be ugly?), too out of the ordinary (why should that happen?) Is the reaction positive because it is equally useful to other users (e.g., a lowered telephone for children or short parsons; a ramp for baby strollers or bicycles)? This consideration is important, since consciously or unconsciously it affects the attitudes of able-bodied persons toward disabled individuals: negative reactions tend to focus attention on the disability itself, and thereby reflect unfavourably on disabled persons in general.

7 - What are the operational problems inherent in the accessibility solution?

Here again cost-effectiveness plays an important role in making the chosen solution viable. Does someone have to unlock locked doors to make the barrier free feature accessible? Does the disabled person have to have permission, a special key, or call ahead? Is there unnecessary mechanical/electrical equipment that is liable to break down? Is the accessible feature difficult to find? Must one have knowledgeable information before reaching or using it? Must one be accompanied? Does someone else have to operate the equipment? Does it necessitate exceptional maintenance? Is it as easy to use in winter (with ice and snow) as it is in summer? Is there a simpler solution to the problem that has to be resolved?
8 - How esthetically pleasing is the accessible feature?

Is the feature visually integrated with the architecture and the decor? This is a far from superficial consideration, since it too can have an impact on the acceptance of disabled persons as equal citizens in our social and physical environment. In addition, many accessibility requirements such as ramps, textures, handrails, colour contrasts and height differentials offer the creative potential to incorporate them in ways that expand the design vocabulary while enhancing its functional character. Far from being distracting, the careful integration of useful features can profitably enrich the visual quality of both exteriors and interiors of buildings.

9 - Is the signage appropriate, adequate and well located?

Is there uniformity in the symbol and combination of symbols used to transmit the same message? Is there complete and correct signage pointing to the location of non-evident accessible features? Is information provided in a central area giving the location of all accessible exits, toilets, telephones, special elevators etc. so that noone has to hunt for them? Is there a coloured and brailled map locating the circulation, service facilities and all public spaces? Are the signs visible to visually impaired users? Are the messages understandable? One short note: the international symbol of accessibility should be used with care. It is not necessary that an obvious accessible feature be identified once it has been reached; the symbol should not be overused in a way that increases visual confusion and affects decor consistency. Are hearing-impaired people shown facilities for them? Is raised lettering used where it can be reached? Are all potential users considered?

CONCLUSION

The foregoing evaluation criteria review many aspects that have to be considered not only when evaluating but also when creating a barrier free environment. They raise questions of principle, not of specific situations and solutions, and certainly not of technical details. These have been dealt with in detail in the report to Public Works Canada (Faluta, 1982). Given the variety of criteria be integrated in any one solution, it is evident that each situation must be judged independently within the given context. That is a main reason why check-lists are simply inadequate.

The evaluation framework emerged as I tried to judge and classify the accessibility features I observed. If the truth be said, any comprehensive evaluation was impossible. I could not even contemplate the "barrier free" concept, because only wheelchair accessibility had been improved. And not always in the best fashion, either. I sensed self-conscious, uncertain design gestures, reflecting a lack of both comprehension and acceptance on the part of the designer. (It is fair to say that for each of the buildings a different architect was employed, though several worked under one supervising PWC architect.)

It was surprising to note (if not altogether shocking) the lack of coherence in the standards applied (and certainly no adherence to the PWC Design manual), and there were wide discrepancies in the ways that basic accessibility had been provided. Here I am not speaking only of retrofit, but also of new installations. Each ramp, each door, handrail, toilet, washbasin, even sign, was treated differently, and none of them could be ascribed to any code that I could identify. Why is this? Even within the same building, different solutions (some better and some worse) were used for the same functional situation.

If I apply my evaluation criteria to the various features, new and retrofit, in the nine categories they would rate variably as good, bad or medium. Few of them would get top marks. How can that be? Designers pride themselves on the ability to create good design solutions while respecting technical codes and specifications. Some of my findings did not support those claims. Certainly I respect a designer's freedom to propose individual, interesting solutions, and I applaud the good ones. On the other hand, many solutions showed little consideration for the objectives underlying the technical requirements, with the result that they were functionally and operationally unsatisfactory (if not dangerous) and visually drab.

Furthermore, there were rather broad interpretations of design standards, and both extremes were observed: some very careless applications and some very obvious overdesign, some designs responding to things, rather than to people.
At the same time, there were excellent solutions, ones where accessibility was incorporated into both the functional and visual setting, attractive and unobtrusive. There were also solutions that, despite evident concern and effort, did not adequately solve the problem. I commiserated with their creators...

Where does the problem lie?

Appropriate accessible building design -- barrier free for all users -- starts with the conviction that such design is functionally useful, necessary, visually interesting, serves not only a small portion of the population but is valuable to all users. This positive, common-sense attitude is the basis towards a progressively barrier free design approach. Without it, we will continue to have poor accessibility solutions. It is not a simple question of closer adherence to the standards, but more essential is understanding the issues which those standards address. We have to fill an information void regarding the intent of accessibility standards and their possible interpretations. Through education we can start to eliminate the negative attitudes that form a barrier, and open the way to good accessibility for all.

In order to speed the education process, we need the active participation of the persons for whom design modifications were originally intended. All the evaluation guidelines available, even the most enlightened and comprehensive ones, result in professional evaluations which, for better or worse, remain an exercise carried out in a vacuum. Meaningful evaluation can only come about when disabled people, with their many types and levels of disabilities, use a building and facility frequently, and provide individual feedback on how each accessibility feature serves or hinders them. Every disabled person has different needs, different methods of coping in various circumstances, and different reactions to the quality of what has been provided.

Despite the best efforts of any team to check equipment, simulate its use, compare it to standards and make educated extrapolations about the needs of other disability groups, the only valid evaluation will come when disabled users/consumers will be able to render their verdict "en bloc". We must welcome these people into the buildings to seek services, information and work.

Only users can really tell us what is missing and what works. It is a user evaluation that will give the final answer.

REFERENCES


INTRODUCTION

Some twenty years of creative, prolific, and scholarly achievement is evident in the artifact below: Donald Appleyard's bibliography. The remarkable breadth of Appleyard's interests are apparent in this list of writings, which range from environmental simulation to street livability; from urban conservation to environmental symbolism. There is, however, a unifying theme in his work which stems from his own philosophy that people and physical place are critically linked in the understanding, evaluation, conservation, or planning of any environment.

Although many readers are familiar with a portion of Appleyard's work, they will also be surprised to learn of his extensive publication in other domains. In order to usher scholars, designers, researchers, and students into the corpus, five categories are used to summarize Appleyard's work. Individual articles, reports, and books have been listed within a single category, even though a majority of these writings are more integrative than might be implied by such categorization.

A. Understanding the Environment:
- environmental perception, environmental psychology, and the Ciudad Guyana project (Ref. #'s: 1, 2, 6, 25, 30, 31, 32, 37, 38, 50, 56, 75, 84)

Donald Appleyard's work in the 1960's, with Kevin Lynch at M.I.T. and with the Ciudad Guyana project in Venezuela, explores physical form as reflected by human understanding. He focuses on the ways people structure their perceptions of environments and the nature of those mental representations which are influenced not only by the physical setting but also by travel mode, spatial and temporal context, familiarity, and social significance. Dominating these works is the general orientation of cognitive psychology which leads to an understanding of the environment as it is understood by its inhabitants, and to the design of responsive environments. Many of the ideas embodied in these writings can be found in the book Planning a Pluralist City, based on the Ciudad Guyana research.

B. Urban Planning, Design, and Conservation
(Ref. #'s: 3, 4, 6, 7, 8, 11, 14, 17, 24, 26, 34, 78, 89, 91, 92)

In further writings about the urban environment, Appleyard brings an expanded set of concerns, which include not only psychology, but economics, politics, sociology, and history, to his analysis of extant built and open spaces as well as to the planning of future environments. Appleyard was involved with his own cities, evident in the writings about Boston, Berkeley, and San Francisco. Most recently, he edited The Conservation of European Cities, and contributed an eloquent introduction discussing the importance of integrating social and physical conservation in city planning.

C. Neighborhoods, Streets, and Transportation
(Ref. #'s: BART - 12, 13, 40, 42, 44; Livable streets - 5, 10, 16, 18, 19, 36, 45, 49, 64, 66, 80, 81, 85, 87, 88, 90; Transportation environments - 27, 28, 29, 35, 46, 47, 58, 68, 69)

Appleyard was interested not only in the city's built and open spaces, but also in the connections between them—the links, the systems within which we move from place to place. Precipitated in part by a major project for BART (Bay Area Rapid Transit in California), Appleyard completed a number of studies on transportation networks, traffic, and streets. Each is scrutinized primarily in terms of
its impact on the community, especially
the neighborhood. A key notion underlying
these studies is that the street's
livability is central to that of the
neighborhood, such that we must consider
transportation networks not only as
functional circulation systems, but as
environments in their own right.

D. The Process of Environmental Planning
(Ref. #'s: Berkeley Environmental
Simulation Lab - 15, 41, 43, 48, 52,
53, 65, 67, 73, 74, 83; Participatory
planning - 9, 33, 39, 51, 76, 77)

Another kind of connection that concerned
Appleyard was the link between extant and
future environments--the planning process
itself. His writings cover a range of
issues in environmental decision making,
primarily community participation and
visual media as design communication
tools. In terms of the latter, Appleyard
spearheaded the development of the Berke­
ley Environmental Simulation Laboratory
--an immense, intricate system for guiding
a movie camera on a probe through small
scale models of environments. One of
Appleyard's intentions was to present to
the public visual alternatives for actual
planning projects, but the simulator was
not used in this manner as often as he
might have wished. The simulator was,
and is, however, an extensive resource
for the study of design media and envi­
ronmental cognition.

E. Environmental Symbolism
(Ref. #'s 54, 55, 59, 60, 62, 63, 70,
71, 72, 79, 82, 86)

In the last years of Donald Appleyard's
life, an interest stemming from a number
of those mentioned above consumed an
increasing share of his curiosity: meaning
and social symbolism in the physical
environment. He was intrigued by the
different connotations palm trees held
for Northern versus Southern Californians,
by the symbolic importance of place for
communities, and by the family home's role
as an expression of its inhabitants.
Don's untimely death left unfinished the
book planned to coalesce his work in this
domain.

A Note About the Bibliography

The intention of this bibliography is
to gather the vast and widely dispersed
writings of Donald Appleyard so that
his oeuvre is accessible to scholars,
researchers, designers, and students. The
majority of writings are obtainable, while
some are only available in select
libraries (the Rotch Library at MIT and
the Library of the College of Environ­
mental Design at UC Berkeley probably have
the most complete collections). In
addition, the Institute for Urban and
Regional Development (IURD) at the Univer­
sity of California, Berkeley (zip: 94720)
distributes reprints of a large number of
Appleyard's works for a minimal fee.

The citations below are organized first by
type of publication and then by date of
publication. The majority of entries come
from Appleyard's own vitae, and from a
bibliography compiled by his friend and
colleague, Dr. Kenneth Craik.

BIBLIOGRAPHY

BOOKS

1. Appleyard, D., Lynch, K., & Myer, J.R.

2. Appleyard, D. Planning a pluralist
city: Conflicting realities in Ciudad

tion in Europe and America: Planning,
conflict, and participation in the
proceedings of the European Regional
Conference of Fulbright Commissions,
1977.

4. Appleyard, D. (Ed. and author of
introduction, pp 2-49). The conserva­
tion of European cities. Cambridge,

5. Appleyard, D., with Gerson, M.S. &
Lintell, M. Livable Streets. Berkeley,
CA: University of California Press,
1981 (paperback, 1982).

REPORTS and MONOGRAPHS

Guyana project, Venezuela. Cambridge,
MA: Joint Center for Urban Studies,
MIT and Harvard University, 1962.

7. . An environmental improvement
program for metropolitan Boston.
Cambridge, MA: Joint Center for Urban
Studies, MIT and Harvard University,
January 1966.

9. & The Landscape Architecture Department of the University of California, Berkeley. Community participation in the planning, design and construction of neighborhood parks. White Paper for the Academic Senate Policy Committee, People's Park Crisis, University of California, Berkeley. Spring, 1969.


BOOK REVIEWS


ARTICLES


31. ___ Why buildings are known: A predictive tool for architects and planners. Environment and Behavior, v. 1, n. 2, December 1969, pp. 131-156. (See also #75.)

32. ___ Styles and methods of structuring a city. Environment and Behavior, v. 2, n. 1, June 1970, pp. 100-117. (See also #'s 56, 57.)


91. , & Jacobs, A. Hacia un manifesto sobre diseno urbano. Intorno, v. 1, nos. 1 & 2, April 1982 (Mexico City). (See also #92.)

The environment-behavior-design field is a growing one, with strong research efforts in countries other than the United Kingdom and English-speaking North America. As this discipline gains international stature, more effort is needed to assess the international state-of-the-art, compare theories and methodologies, establish priorities for research, and develop common research programs. This workshop will consist of an open panel discussion in which researchers from the international scene will discuss the status of environment-behavior-design research in their countries, the degree of national organization and interdisciplinary integration, and the potential for international organization.

Workshop discussion will revolve around a set of questions relating to the above-mentioned issues. The status of research in the participant's countries will be assessed by examining important actual and potential contributions, previous research traditions that lend direction and support to environment-behavior-design work, and an evaluation of ideas or techniques that have been used. The workshop organizers have proposed a typology of levels of development of research (Saarinen, Sell, and Husband, 1982), which will be used as a starting point for discussion of the degree of organization and interdisciplinary integration within the participants' nations. Other questions of national development will center around the mix of disciplines involved in this research as well as gaps in the overall field. Also important is the degree to which researchers in each nation are attuned to work in other nations. The final set of questions examines the potential of integration of research on an international level, including evaluation of the need for such integration, discussion of mechanisms for cooperative efforts, development of research priorities, and suggestions for improved channels of communication.
While in Lincoln, Nebraska in November 1982, for the mid-year meeting, the EDRA Board of Directors held an intense ten-hour planning workshop. The purpose was to review several possible scenarios for "EDRA Future" as part of the Board's obligation to give direction to the Association.

The three scenarios developed by Mike Brill, Robin Moore and Lou Sauer and which were the primary subject of the workshop are:

- Public Education and Advocacy. The major mission would be to provide useful environmental design research knowledge "to the world" and to initiate, advocate and support social change towards humanistic design.

- Services to the Membership. The major mission would be to provide an expanded set of professional services to the members, both through EDRA and through formal links to other organizations with complementary interests.

- Cross-Disciplinary Ongoing "Circus". The major mission would be to provide intense and ongoing intellectual and social collegiality, to create an identity for, and a community of environmental researchers and designers who learn and benefit from each other and from each other's work.

The "Planathon Report" will discuss each of the scenarios and the implications with regard to:

- The annual conference
- A publication program
- Relationships with other organizations and the public
- Relationship to the EDRA membership
- The organizational structure, including the role of the Board and the Executive Director

Response from the memberships will be invited. Such critical and constructive membership response will become a part of the continuing planning process for EDRA Future.
ENERGY-BEHAVIOR RESEARCH: RELEVANCY IN THE REAGAN ERA

Co-Chairs: Min Kantrowitz
Min Kantrowitz & Associates

Richard Wener
Polytechnic Institute of New York

Panel: Duncan Case
University of Tennessee

Mike Edelstein
Ramapo College

Min Kantrowitz
Min Kantrowitz & Associates

Richard Wener
Polytechnic Institute of New York

WORKSHOP SUMMARY

Research on social and behavioral issues involved in energy efficient design and energy use and conservation behavior has decreased markedly in the last several years. This is due in part to the slowing of the rate of energy cost increases, which has helped remove the issue from the forefront of public consciousness. It is also a result of changes in priorities for energy policy in the new federal administration. Conservation and solar energy are no longer bywords in Washington, D.C. Research in these areas is not receiving the strong support it did just a few years ago.

In spite of this trend, however, some research in energy use and design is still finding funding. There is still a significant contribution research in this area can make to understanding fundamental issues and designing policy. The goal of this workshop is to use discussion among the panel and audience members to assess the status of energy-behavior research in today's environment. In particular, we will try to focus discussion in four areas: the current state of research (what are the intellectually promising areas to explore); the relevancy of what we know to policy at local or national levels; the availability of funding (who has money and for what); and what are the possibilities for setting up an EDRA-based consortium of interested researchers to jointly write grant proposals.

We will invite local and national policy makers in this area to take part in this meeting.
SOCIAL ENGINEERING FOR ENERGY CONSERVATION: DELUSION OR FACT?

Janet Schnorr
Northern Arizona University
Flagstaff, Arizona

Dan Levi
University of Arizona
Tucson, Arizona

Min Kantrowitz
Min Kantrowitz & Associates
Albuquerque, New Mexico

WORKSHOP SUMMARY

With dwindling energy supplies and increased energy costs, politicians, governmental agencies, utilities and other interested groups in the nation are attempting to change attitudes and behaviors of the American consumer. Although society is constantly changing, predicting or controlling social attitudes and behavior is often ignored by non-social scientists who promote technological innovation for solutions to social problems. The pattern of excessive energy consumption by American consumers will be solved by modern technology only if accompanied by social engineering.

This process of social engineering for change needs to be explored from many aspects including 1) public awareness of energy producers' operating policies and procedures, 2) structural and functional interaction of energy producers with state and public agencies, 3) determination of costs/benefits of social change on impacted groups (consumers, utilities, business, government), and 4) ethical considerations of marketing social change. This workshop will explore various viewpoints on social engineering as well as methods and procedures which could be implemented.
RESEARCH PROJECTS & TEAM PARTICIPANTS:

University of Illinois

Dorothy I. Butterfield, Organizer

Georgia Institute of Technology and University of Illinois

James R. Anderson
Susan Edwards
Sue Weidemann
Jean D. Wineman
Craig M. Zimring

University of Minnesota

Julia W. Robinson

RESPONDENTS:

Leanne Rivlin, Environmental Psychology Program, City University of New York

Becky Hanna, Community Planner, Lincoln, Nebraska

Kevin Casey, Executive Director (ENCOR), Eastern Nebraska Community Office of Retardation, Omaha, Nebraska

Gerald Mueller, Executive Director, Lancaster Office of Mental Retardation, Lincoln, Nebraska

WORKSHOP SUMMARY

This workshop will focus upon residential environments for developmentally disabled persons. Of special concern will be the opportunity such environments provide for residents to learn daily living skills and to foster personal growth. Based upon information from their research, each of the three teams will discuss design and management issues related to these goals. These issues will then be examined in terms of their relationship and congruence to the principle of "Normalization." Such issues which are expected to be addressed include: What design components allow residents to acquire practice in performing basic living skills? Which designs inhibit residents' control over their environment? How do the management policies and rules affect the ability of residents in the home to use environments which encourage practice of skills? How does an environment which seems to encourage "normal" behaviors by the residents conform to guidelines related to "Normalization"? Are environments which are designed in accordance with the "Normalization Principle" the same environments in which the most "normal" behaviors occur? Respondents will be asked to react to the information presented. The researchers will then respond briefly, and the workshop will be opened for general discussion. Hopefully, this workshop will result in creative suggestions for future research.
FROM IDEA TO IMAGE TO EVENT:
A COMMUNICATIONS WORKSHOP

E. G. Bailey, Organizer
Communications Specialist
The Planning Research Institute
Albuquerque, N.M.
Visiting scholar, CUNY

Donis Dondis, Resource Person
Former Dean, School of Public
Communications, Boston University

Alan R. Sandler, Resource Person
Director, Public Education, AIA,
Washington, D.C.

Ray Lorenzo, Resource Person
Community Planner
Department of Environmental Psychology
CUNY

Gary Moore, Discussant
School of Architecture and Urban
Planning, University of Wisconsin-
Milwaukee

Participants: Architect, research
designer, architectural-scientist client,
user, EDRA attenders.

WORKSHOP SUMMARY

This workshop will link architects,
researchers, decision makers, clients and
users in new ways to gain insight into
the production of a more efficient
product. The emphasis will be on visual
communication as synthesizer.

As work in the field of environmental
design becomes more sophisticated, com-
munication issues expand beyond the ideas
of mere "translation". Giving more
information to designers or clients or
users does not necessarily produce better
environments.

One suggestion has been to create an
interdisciplinary field where distinctions
between research and design are elimi-
nated. How can this be achieved? As
pointed out by Purcell and Heath, EDRA 13,
designers usually think visually,
specifically and to a single goal, whereas
researchers think linearly, verbally and
in terms of a range of alternatives
(p. 3).

And what about the client and the user?

If we are going to create this common
discipline or bridge the gap between
disparate people in the production of the
product, we need to create some new
methods. Participatory design is part of
the process. But what is that exactly,
and how can it be made to work effec-
tively?

This workshop will address these
questions. It will include short state-
ments by the resource people. Dondis
will help explain why visual communi-
cation is effective in the process in an
analysis of visual syntax and visual
image. Sandler will contribute informa-
tion on the AIA education efforts with
individuals, neighbors, "tastemakers" and
policy makers. Lorenzo will use his
experience with visual collage as a means
of participatory design. Moore will
comment. Bailey will facilitate.

The bulk of the workshop will be a
hands-on experience bringing together
architects, planners, designers, clients
and users in the solving of a common
problem. Photography, collage and
other media will be available for the
participants.

The results of the workshop are expected
to be heightened mutual awareness,
enhanced understanding of the parameters
of the creative transaction, and
possibly the adoption of some new tools
to use in the respective worlds of the
researcher, designer, client and user.
PASSIVE SOLAR DESIGN OF ESSEX-DORSEY
SENIOR CENTER, A QUESTION OF BALANCES:
CASE STUDY PART I

Barbara Sandrisser
The Paul Partnership

Robert Dolny
The Paul Partnership

Roberta Feldman
City University of New York
Environmental Psychology Program

Sidney Brower
The University of Maryland
Baltimore School of Social Work and
Community Planning

WORKSHOP SUMMARY
PURPOSE

This session explores the question of balances, the fundamental issue which evolved during the design and subsequent development of the Essex Dorsey Senior Center located in Essex, Maryland. In order to share the concepts first and the analysis later, we divided the workshop into two sessions: Part I, presented this year, April 1983, concentrates on the conceptual aspects of the building, and the behavioral studies now being initiated. Part II, suggested for April 1984, will evaluate the functional and aesthetic qualities of the building, and share the results of the behavioral analysis and the instrumentation analysis. The project combines a newly designed addition with rehabilitation of two Victorian school buildings resulting in one unified structure. The architectural team used an interdisciplinary approach to try to merge the various behavioral and architectural elements which were:

1) Special design for the elderly,
2) Passive solar components,
3) Historical considerations, and,
4) Community/contextual factors.

For the design they called upon their experience with Japanese and Swedish ideas of encouraging physical, intuitive, and cognitive integration of human beings with nature. The building, part of DOE's passive solar demonstration program, is now complete and ready for occupancy.

FORMAT

1) Introduction (Barbara Sandrisser) -
A brief background using slides, and
a discussion of conceptual and
aesthetic balances focusing on: a) Balancing the Victorian image with a
different vernacular approach, b) Balancing the old with the new--
eexisting structures with the new
design, c) Balancing the indoors with
the outdoors--human beings with
nature, and d) Balancing Japanese
and Swedish aesthetic concepts with
American ones.

2) Balancing Passive Solar Design
(Robert Dolny) - focusing on: a) Balance of intuitive concept and
analytic tools, b) Balance between
cost and performance, c) Balance of
solar elements with architectural
concept, and, d) Balancing solar
priorities within the design--
daylighting, ventilation and heating.

3) Achieving Balance Between Architect
and Behavioral Scientist (Roberta
Feldman) - focusing on: a) Collabora-
tion between architect and researcher,
b) Balance between behavioral obser-
vation and physical environmental
measurements, and c) Balancing forced
response questionnaire and perceptual
data collection.

4) Achieving Balance in Behavioral
Evaluations (Sidney Brower) - focusing
on: a) Balancing data gathering for
application and data gathering for
methodology, b) Comparing physical
and behavioral evaluation, and c) Correlating the differences between
technical instrumentation and occupant
response.

CONCLUSION

Some of the issues concerning the question of balance should spark concluding discussions on:

1) Getting acceptance: from the client,
   from the elderly and from DOE.

2) Balancing contemporary technology with
   a low technology approach.

3) Balancing needs: DOE, the client
   (the County of Baltimore), the users
   (the elderly), the evaluators, the
designers.
BARRIER-FREE DESIGN MODIFICATIONS: EVALUATING THEIR SUCCESS IN EVERYDAY USE

Carolyn Norris-Baker
Kansas State University

Mary Ann Parris Stephens
Kent State University

Discussant: Bettyann Raschko
California State University-San Francisco (Emeritus)

Recently implemented policies on the accessibility of public facilities (e.g., Section 504 of the Rehabilitation Act of 1973, American National Standard A117.1 (1980), and newly revised state and local building codes) have far reaching consequences both for the quality of design and for the quality of life of all persons. These policies have resulted in numerous and increasingly sophisticated guidelines for accessible design. However, empirical evaluations of the effectiveness of design standards in facility modifications are insufficient. Post-occupancy evaluation of such facilities can indicate how useable these spaces actually become on a day to day basis for people with disabilities.

This workshop will focus on evaluations by wheelchair users of barrier-free modifications made on two university campuses. These sites represent a microcosm of the kinds of public environments subject to accessibility regulations. A total of 30 students, 15 at each campus, participated in the evaluation of 26 facility modifications. Researchers recorded the abilities of subjects to use each modification without help, their judgment of difficulty in use, satisfaction with the design modification, and spontaneous comments about positive and negative aspects of the modification.

The purposes of this workshop are: (a) to enhance the sensitivity of designers to some of the problems encountered by the physically disabled people in the everyday use of barrier-free modifications (b) to present data from the evaluation of the effectiveness of barrier-free modifications as a focus for discussion, and (c) to provide a forum for exploring the impact of information from such evaluations on future design decisions, standards and guidelines, and public policy. In order to encourage active involvement by all participants, the following format will be employed.

*Provide an overview of problems faced by designers in this area.

*Illustrate some of the problems wheelchair users often encounter in the day to day use of modified environments.

*Present examples of specific modifications in terms of their approximation to current standards, as against the ability of users to negotiate them independently, the difficulty in use, and satisfaction with the modifications.

*Discuss the impact of nondesign variables, such as weather conditions and maintenance, on the everyday effectiveness of facility modifications.

*Discuss the use of barrier-free environments by nondisabled users.

*Employ some of these specific examples of adequate and inadequate modifications as catalysts for discussion about the consequences of employing barrier-free requirements as an integral part of the design process.
Design Alternatives for an Outdoor Courtyard

Preferences for outdoor courtyard design were measured by surveying 200 randomly sampled patients and visitors who responded to an interviewer's questions about a series of black and white photographs. These photographs of a specially constructed three-dimensional model showed different design alternatives for an outdoor courtyard. Eleven different issues pertaining to planting density and the arrangements and types of seating were examined. The researchers worked closely with the project Landscape Architects to implement the study's recommendations.

Hospital Graphics and Signage

Research was undertaken to discover patient, visitor and staff familiarity with different hospital terms (from the name of the medical campus, to names of medical departments and individual rooms) and their understanding of potential pictorial symbols. Through a series of related studies, a set of recommended terms, symbols, and sign-spacing distances were developed. The researchers will discuss their findings and the process for implementation.

Researchers from Bellevue Hospital and the City University of New York will discuss the following projects:

Research on Environmental Factors Promoting Patient Mobility and Independence

Research on a surgical unit exploring the potential of specific design elements in social spaces to increase patient mobility while decreasing passivity will be discussed. The use of research to identify ways to enhance patient independence and competence by the removal of architectural barriers and the improvement of environmental control will also be presented in a study of in-patient rehabilitation and microsurgery units.

Preliminary Design Planning in a Multi-Use Emergency Ward

The purpose of this research involved the investigation of the design, organizational and individual difference variables that affect patient use and
evaluation of different areas of the Emergency Room. Observational and questionnaire data were gathered from staff, patients and visitors in the Emergency Room, the Emergency Walk-in Clinic, Pediatrics Emergency and Psychiatric Emergency. Factors affecting patient stress were assessed in the context of design changes.
welcoming image and sufficient orientation cues for patients.

The Evaluation of an External Park at Bellevue Hospital

As part of the ongoing renovations at Bellevue, a new park was constructed at the Hospital's Entrance. The case study to be summarized here focussed on user evaluation of the park from the perspectives of patients, staff and visitors.

The Evaluation of Admissions Offices

Human Behavioral Needs in Hospital Admissions Management: Some Architectural Implications: A need existed to develop architectural design principles for use by architects/planners and hospital personnel, which supported the admissions process and responded to the behavioral needs of admitting's primary users (staff and patients). The project identified major behavioral needs and examined supportive contributions of physical design in twenty-six Chicago and Milwaukee hospitals.

The needs -- communications, confidentiality (privacy), safety/security, and stress reduction-- became apparent after hospital experience, literature reviews and a pilot study. In the main study these needs were assigned priorities in order of urgency for staff and patients, respectively, and the architectural elements affecting needs were examined. The research presents a range of design principles that extends beyond functional into behavioral needs.

WORKSHOP SUMMARY

This workshop will focus on evaluation research undertaken to assess different design options for various hospital services. In addition, open discussion will focus upon the challenges and opportunities for health related research programs.

Projects to be discussed will include:

Continuing Evaluation of the Entry to Bellevue Hospital

Two years ago it became necessary to develop an interim entry to Bellevue Hospital due to major structural changes designed for the existing entry. The design of the interim entry allowed the research group to implement a number of design changes organized around patient orientation and access to hospital services. Utilizing behavioral information, a number of changes were introduced and evaluated. The results of this research contributed to the design of a new entry to the hospital. This project will be discussed in the context of creating an entry with an appropriate
DESIGNING FOR PERSONAL CONTROL IN HAZARDS
AND DISASTERS

Christine L. Hansvick
Pacific Lutheran University

John Archea
Georgia Institute of Technology

Robert O. Hansson
The University of Tulsa

John P. Keating and James A. Wise
University of Washington

Michael Lindell
Battelle HARC

WORKSHOP SUMMARY

The goal of this workshop is to share but also to solicit specific design solutions to help potential victims deal with natural and/or man-made disasters. Information processing is the key element across all these situations, since it is directly related to predicting the disaster, reacting correctly during the life-threatening situation, and recovering following the disaster.

Each workshop participant will discuss a particular area of hazard or disaster research and suggest possible ways in which more adequate coping behaviors can be enhanced environmentally. John Archea will examine behavior during earthquakes and is interested in establishing more realistic expectations on the part of victims. Robert Hansson will discuss his research on behavior related to flooding. He is especially interested in the effects of the stress accompanying disasters upon the elderly. John Keating will share his design solutions for eliminating potential for disaster in major hotel fires. Michael Lindell will concentrate upon risks at nuclear waste sites and power plants, while James Wise will suggest ways in which emergency control operations centers for energy companies can be improved to handle disasters more effectively.

Following the presentations by individual participants, audience reaction and discussion will be invited. The concept of personal control will be explored as it applies to an even wider variety of environmental issues (e.g., other disasters, media coverage of events, pollution and toxic waste contamination). Specific design solutions will be encouraged and stressed wherever possible.
CHILDHOOD CITY: GRAFFITI IN THE URBAN ENVIRONMENT

Sheila Lehman
Stephan Klein
Vincent Bogart

Environmental Psychology Program
The Graduate School and University Center
of the City University of New York

Joel Feiner

Albert Einstein College of Medicine

WORKSHOP SUMMARY

There is growing concern in New York City and other large urban areas with the graffiti which appears most conspicuously on subway trains, but seems to be everywhere in the environment. Massive official attempts to prevent and eradicate it have failed. Why is graffiti writing so attractive to the urban youth who create it? Is it vandalism, folk art, or something else? How does its presence impact the quality of urban life, and reflect complex and conflicting attitudes toward public and private space? While there have been a great many journalistic pieces profiling graffiti writers and praising or damning their productions, serious research on this subject is scarce, and must be sought out in the literature of a variety of disciplines.

The Childhood City graffiti workshop will take a close look at some examples of graffiti, and introduce participants to the complex adolescent subculture that has developed around graffiti writing. The workshop will have three parts. First, an audiovisual presentation will define and describe the graffiti phenomenon and raise some of the issues which we feel are salient. Next, a group of panelists will briefly discuss their work in the area, focusing on developmental, cognitive, territorial, political and other approaches to an understanding of environmental graffiti. This will be followed by an open discussion period, during which all participants will be able to ask questions of panelists as well as to communicate their own ideas and experiences.
CHILDREN'S PERCEPTIONS & REPRESENTATIONS
OF HOME & NEIGHBORHOOD ENVIRONMENTS

Susan Saegert and Nathan J. Maltz
Center for Human Environments
City University of New York

Anthony Filipovitch
Urban and Regional Studies Institute
Mankato State University

Franklin Becker
Department of Design and Environmental
Analysis, Cornell University

Sidney Brower
School of Social Work and Community
Planning, University of Maryland

WORKSHOP SUMMARY

This workshop will be devoted to a discussion of how children perceive and represent their home and neighborhood environments and what meaning those perceptions have for them.

Many questions were generated by pilot research conducted by Susan Saegert and Nathan J. Maltz. A small sample of 6th grade girls and boys who live in high density urban environments were asked to draw plans for their homes, and route maps to specific places in their neighborhood. They were also asked many questions about their activities, interests, hobbies, parents, favorite places, likes and dislikes. They were given the task of locating particular places on an aerial photograph of their neighborhood. Analysis of the data indicated some interestingly suggestive findings. For instance, girls seemed to express their attachment to or interest in a place through greater articulation of elements and detail; boys tended to express it through greater structural coherence, and some through less articulation of detail. For girls there was a negative correlation between structural coherence and articulation of detail. Boys' articulation of detail in the home seemed related more to a sense of separation or withdrawal from the social life of the home, whereas girls tended to articulate parts of the home that served as a backdrop for social life. Preferences for and more frequent use of indoor rather than outdoor facilities seemed to be associated with less developed structural representations for both sexes.

These findings and other issues will be discussed with colleagues who have conducted similar research. Anthony Filipovitch has data on the variations in perception and usage of children from rural, small town and city environments. Franklin Becker can raise issues about how the use of the home as a parents' work environment influences the perception of children: how the home-workplace offers expanded learning opportunities for children, and how their perceptions are affected by the allocation of specific places in the house for particular family members and uses. Sidney Brower has findings on children's use of outdoor space in the home neighborhood.

Questions which will be raised in discussion include the following:

How do children's patterns of activities, preferences, and expectations for the future correlate with their styles of drawing and the elements they choose to show. Do children who are engaged in greater motoric and exploratory behavior produce more objectively accurate drawings? How do their representations relate to the children's attachments to the places represented?

Are there systematic sex differences in evidence on the drawings, and do these relate to differences in ability or familiarity, or to differences in interests and importance of certain types of activities for the two sexes? Are patterns of interrelationships of representational styles and the elements shown similar or different for the two sexes? Are the processes involved in spatial representation similar or different? Are similar sex differences to be found in the representation of both interior and exterior environments? And in rural vs. urban environments?

What hypotheses can we generate regarding specific types of facility with spatial representation? How are developmental differences which influence children's interests reflected in their representations? How do children think of the effects of their particular environments on their lives?

From the information exchanged through a discussion of these questions we hope to gain greater insight into the perceptions and representations of children, and to formulate directions for future research.
"THROUGH THEIR EYES"
EMPATHY AND DESIGN FOR LONG-TERM CARE
FACILITIES

Barbara L. Geddis
Associate Partner,
The Gruzen Partnership

PURPOSE OF THE WORKSHOP

1. To illustrate design criteria for long-term care settings for the aging.

2. To explore the multiple values of videotape for environmental research and illustration.

3. To discuss how the capacity for "empathy," essential in both the architect and behaviorist can be enlarged by means of new media for extending his/her capacity to imagine.

4. To follow and "track" residents of a long-term care facility, and "through their eyes" regard the major parts of their day-to-day living spaces.

5. To engage the participants in a discussion of the prerequisite compassion and imagination that need to enrich new "graphic standards" and design "rules of thumb" of the future.

6. To introduce the possibilities for a new "language" between the behaviorist, the architect, and the residents: space "value," "scale" (as felt as well as measured), and "comfort" (as sensed as well as provided for). This "language" requires no translation; i.e., "visual-to-visual."

PART III "Through Their Eyes," a videotape through the eyes of one wheelchair-bound resident through the long-term care facility where he resides.

PART IV Summary and Discussion.
As the aging can exert less control over their own bodies, the outside environment can easily become more controlling and overwhelming. "Remembering your humanity above all and forgetting all the rest..... "Beauty will look after herself."

Design criteria can promote positive empathy (beauty) where the resident finds himself in "encountering" the object environment. At the same time, new design criteria can uncover where negative empathy (ugliness) is promoted, where the resident's personal self is "repelled" by the object environment.

EXPECTED OUTCOME

Opening up conversations among architects and researchers in language understood by both.

Continuing exploration of a more humanistic philosophy of architecture that knows the familiar from the surprising, that understands balance, can include eccentricity, that, above all, remembers........how to see.

- and, losing detachment, thereby identifying,
- downplaying rationalization; in turn, favoring feeling,
- setting aside bias, thus preparing to speculate and take risks,
- abandoning dogma and rules of thumb for fresh and direct approaches to design.
the memory of ... home

the garden

the veranda

the living room

the bedroom

250
WORKSHOP PARTICIPANTS

Barbara L. Geddis,
The Gruzen Partnership
Marc Lichtman, Miami Jewish Home and Hospital for the Aged
Martin V. Faletti,
Stein Gerontological Institute

ACKNOWLEDGMENTS


Miami Jewish Home and Hospital for the Aged, at Douglas Gardens; Board Administration and Staff; Fred Hirt, Executive Director; Marc Lichtman, Associate Administrator; Elliot Stern, Associate Administrator.

Stein Gerontological Institute: Dr. Martin V. Faletti, Director, Program Evaluation.

The Gruzen Partnership, Architects and Planners, Project Team: Barbara Geddis, David Ziskind, David Augustine, J. David Hoglund, and Hortensia Mateos.

Illustrations from Downing, The Architecture of Country Houses; original sketches from The Gruzen Partnership; other photographic materials and credits noted in the videotape, and,

Special acknowledgments to all of the Residents of the Miami Jewish Home and Hospital for the Aged.

BIBLIOGRAPHY


"WHAT ABOUT TOMORROW: THREE WORKSHOPS
ON A THEME" - PART I - SPECULATE ABOUT
THE FUTURE, PART II - THE ROLE OF
DESIGN, RESEARCH AND COMMUNITY
DEVELOPMENT, PART III - WHAT NOW?

Paul Heath
Michael Smith
Tom Edmiston

Center for Community Development and
Design
University of Colorado at Denver
Denver, Colorado

WORKSHOP SUMMARY

It is quite apparent that as designers and researchers most of our effort is expended on doing work. We are trying to make an impact on our environment and making an impact necessitates the doing with all its component acts. However, at times it is also necessary to stop and look at what we are doing and why we are doing it. Changes in the economic, political and social climates over the past few years have led some of us to sense the need to raise some questions about our work. We are interested in looking anew at our work and how, or if, that work should change.

Our specific concern is with the future because that is the arena in which we will soon be acting. We are proposing making some educated guesses about the future based on what we know about the present. Given that future, or futures, we then want to talk about our role as designers, researchers, and community developers and how we can start now to develop that future. Our desire is to exchange some ideas about the future and about our work. Our intention is to enjoy the speculation.

PART I - SPECULATE ABOUT THE FUTURE

Part I is designed to do some futures thinking. The goal is the generation of scenarios describing 'our world' in the future. The structure of the session, including methods, time frames and initial areas of emphasis will be provided by the organizers. The content, including issues, problems and specific areas of emphasis will be provided by the participants. Our expectation is that by looking at what is and speculating about what might be, we can generate some scenarios about

the future. These scenarios will then be used in "What About Tomorrow - Parts II & III".

There are no prior assumptions about 'correctness'. The only assumption is that the generation of scenarios will be worthwhile in itself - and enjoyable.
"WHAT ABOUT TOMORROW: THREE WORKSHOPS
ON A THEME" - PART I - SPECULATE ABOUT
THE FUTURE, PART II - THE ROLE OF
DESIGN, RESEARCH AND COMMUNITY
DEVELOPMENT, PART III - WHAT NOW?

Paul Heath
Michael Smith
Tom Edmiston

Center for Community Development and
Design
University of Colorado at Denver
Denver, Colorado

WORKSHOP SUMMARY

It is quite apparent that as designers and researchers most of our effort is
expended on doing work. We are trying to make an impact on our environment
and making an impact necessitates the doing with all its component acts.
However, at times it is also necessary to stop and look at what we are doing
and why we are doing it. Changes in the economic, political and social cli-
mates over the past few years have led some of us to sense the need to raise
some questions about our work. We are interested in looking anew at our work
and how, or if, that work should change.

Our specific concern is with the future because that is the arena in which we
will soon be acting. We are proposing making some educated guesses about the
future based on what we know about the present. Given that future, or futures,
we then want to talk about our role as designers, researchers, and community
developers and how we can start now to develop that future. Our desire is to
exchange some ideas about the future and about our work. Our intention is
to enjoy the speculation.

PART II - THE ROLE OF DESIGN, RESEARCH
AND COMMUNITY DEVELOPMENT

Part II is designed to begin addressing our role as environmental designers,
researchers, and community developers given the futures described in Part I.
It has become quite apparent that recent social, political and economic
changes have altered the world within which we as practitioners work. Given
those changes we are finding an increasing need for some reflection on
both the role and content of our work. Using the futures described in Part I,
we will address these changes and their meaning for work in design, research and
community development. The focus of the workshop will be on key issues arising
out of Part I and tied to the interests of the participants. The nature and
role of our work in the future will provide the overall theme. The structure
for the discussion will be provided by the organizers, but the particular em-
phasis and content will come from the participants.

Reflecting on your work is not easy, but it is both valuable and necessary.
"WHAT ABOUT TOMORROW: THREE WORKSHOPS
ON A THEME" - PART I - SPECULATE ABOUT
THE FUTURE, PART II - THE ROLE OF
DESIGN, RESEARCH AND COMMUNITY
DEVELOPMENT, PART III - WHAT NOW?

Paul Heath
Michael Smith
Tom Edmiston

Center for Community Development and
Design
University of Colorado at Denver
Denver, Colorado

WORKSHOP SUMMARY

It is quite apparent that as designers
and researchers most of our effort is
expended on doing work. We are trying
to make an impact on our environment and
making an impact necessitates the doing
with all its component acts. However,
at times it is also necessary to stop
and look at what we are doing and why
we are doing it. Changes in the eco-
monic, political and social climate over
the past few years have led some of us
to sense the need to raise some ques-
tions about our work. We are interested
in looking anew at our work and how, or
if, that work should change.

Our specific concern is with the future
because that is the arena in which we
will soon be acting. We are proposing
making some educated guesses about the
future based on what we know about the
present. Given that future, or futures,
we then want to talk about our role as
designers, researchers, and community
developers and how we can start now to
develop that future. Our desire is to
exchange some ideas about the future and
about our work. Our intention is to
enjoy the speculation.

PART III - WHAT NOW?

Parts I and II of this workshop have
given us some scenarios of the future
and speculation about our roles as de-
signers, researchers and community de-
velopers in that future. The question
still remains - what now? Part III of
the workshop will consider what we can
begin to do tomorrow to facilitate our
roles in the future. The concerns ad-
dressed in Part III will primarily be
pragmatic ones: what issues need to be
dealt with now, what kinds of resources
are available, can networks help, etc.?
WORKSHOP SUMMARY

The solutions to rising household utility bills may best lie at the community level. Energy solutions to a great extent can be found in each person's hands. Moreover, the pooling of volunteer work efforts at the community scale may offer more satisfying and cost-effective solutions than relying upon centralized government or large utility companies. With the help of a Federal mini-grant, a community wide intensive conservation campaign was conducted in the Winter and Spring of 1982. The results were mixed. The workshop will use this experience as a vehicle to address several issues.

The workshop presents a summary of a $5000 ACTION funded Community Energy Project (CEP) based in the City of Auburn, Alabama (population 35,000). The all volunteer effort sponsored an intensive four month energy conservation campaign. The program included low cost and no cost energy conservation lectures, Home Energy Assistance Treatment (H.E.A.T.) parties (fashioned after Tupperware parties), community awareness activities, and the development of materials and lessons for local public schools. Also, with the help of funds from the Alabama Department of Energy administered through the Lee County Area Council of Governments' Low Income Residential Weatherization Program, the retrofitting of qualifying homes with energy saving materials was conducted by trained volunteers. Materials with a value of fifty dollars or less were installed on each participants' home. A behaviorally based list of conservation steps, tailored to the characteristics of that home and household, was presented to members of the residence. To qualify for the low cost/no cost program, a household must have been living within the city limits of Auburn and have an income not exceeding local Department of Pensions and Securities guidelines.

The workshop focuses on the low income residential retrofit program in which 400 volunteers and 15 volunteer supervisors donated over 5000 hours to weatherize nearly 200 qualifying homes. Experiences regarding volunteer training, development of flexible home audit forms, administration of behavioral energy saving strategies, and relevant low cost retrofits were discussed. Approximately half of the residents serviced by the volunteer effort were older adults, and many of the low income participants were non-readers. Moreover, many of the homes assisted were in such poor condition they could not qualify for a $2000 State Department of Energy home remodeling grant. These and other participant and residence characteristics made the development of behavior and physical retrofit strategies a challenge.

Following the overview and slide presentation of characteristics of the community, its climate, and the CEP volunteer effort, general issues were discussed. These included, in part, (1) the relevancy of behaviorally based energy conservation strategies to individuals (regardless of economic circumstances), (2) the appropriateness of volunteerism to address ongoing community scale problems, (3) the role of scale (community, neighborhood, household, etc.) in the success of energy conservation strategies, (4) the effectiveness of decentralized user based energy conservation strategies, and (5) alternative long-term qualitative and quantitative program performance measures.
The purpose of this workshop is to discuss and examine environmental design factors as they relate to supporting the growth of "whole children" in a university teaching and child development setting. The method which we chose to define the theme of the workshop and initiate the discussion is a presentation of a case study.

For the past year and a half we have been involved in designing and building two new outdoors playyards for the Child Development Lab Preschool at the University of Illinois. Considerations for the preschool, and therefore influences on design, included a) the importance of fostering competence in all areas of development physical, social, emotional, cognitive, and creative; b) the importance of developmental appropriateness for younger or older preschool children, including safety concerns; c) the importance of "zoning" areas for specific experiences and for various energy levels in play; d) teacher satisfaction regarding efficiency of the new yards; and e) implementation concerns budget, scheduling, construction and labor.

The building process involved recruiting and organizing parent, U of I student, and staff volunteers. Throughout the sequence of design-identifying goals, concept formation, specific proposals, and implementation—an interdependency evolved between design and preschool personnel. Ideas, outcomes, and responses to outcomes could then be monitored. The merits of such a team approach will be discussed.

Evaluation processes will also be discussed. It is our eventual goal to learn more about the results of our work. Two major areas for investigation will be interviews on teacher satisfaction, and observational studies of the effects of the new environments on children's and student teachers' activity patterns. A slide and narrative presentation will develop the above issues, and will be designed to precipitate discussion from other workshop participants on reactions, experiences, and insights.
PROGRAMMING AND THE FEDERAL CLIENT

Polly Welch
Building Diagnostics, Inc.
Cambridge, MA

Ron Reinsel
General Services Administration
Washington, D.C.

Jay Farbstein
Jay Farbstein and Associates, Inc.
San Luis Obispo, CA

Over the last ten years a number of federal agencies have been trying to make the process of procuring buildings more accountable to the needs of agencies and building users. Agencies that design and construct buildings find that they benefit by using the information generated in pre-design programs and post-occupancy evaluations to make more informed decisions and to achieve higher design quality. GSA, in particular, over the last three years has developed standard procurement procedures for program documents and a step-by-step guidebook outlining the scope of work for which programming contractors will be responsible. GSA has advertised for and completed its first program using this new approach.

Each of the participants has played a part in GSA's programming effort. Ron Reisel will describe how and why GSA has incorporated programming into its building design process. Polly Welch will explain how the guidebook and procedures for programming were developed to meet GSA's unique needs. Jay Farbstein, the first programmer to contract with GSA using this approach, will respond as a user.

This workshop will examine the usefulness of programming as a tool to improve design quality. Discussion will focus on how design programs help agencies achieve their goals, how programs can be made useful to designers, and integrating programming into government policy and procedures.
THE BUSINESS OF DOING ENVIRONMENTAL
DESIGN RESEARCH

Polly Welch
Building Diagnostics, Inc.
Cambridge, MA

Min Kantrowitz
Min Kantrowitz and Associates
Albuquerque, NM

Jay Farbstein
Jay Farbstein and Associates, Inc.
San Luis Obispo, CA

Gerald Davis
The Environmental Analysis Group, Ltd.
Ottowa, ONT

A growing number of EDRA members are engaged in private practice to provide research and design services to public agencies, institutional clients, and private industry. The EDRA Professional Practice Committee, in developing its mission statement, has identified a number of issues of vital concern to practitioners. This workshop provides an opportunity for an interactive discussion among the EDRA membership of these issues. Topics for discussion will include: 1) Marketing and business development: who needs environmental design services and how do we get people to value these services? How does business competition affect sharing ideas? 2) Recognition: should we look to academic and design practice reward systems—refereed papers and architectural magazine juries—for standards of quality and achievement? 3) Collaboration: how does a small office do both research and design, and what are the benefits of collaborating versus consulting? 4) Liability: to whom are we accountable and what legal responsibilities do we have as practitioners?

Presenters will briefly describe their experiences. In addition to developing a shared image of the range of practical and theoretical issues practitioners address, this workshop will examine how EDRA benefits its members in private practice and in what ways the organization might be more responsive.
ALIGNING THE RESEARCHER'S CRITERIA FOR KNOWING WITH THE PRACTITIONER'S NEED TO KNOW

John Archea
Georgia Institute of Technology

Andrew D. Seidel
The University of Texas at Arlington

Gerald Davis and Francoise Szigeti
TEAG - The Environmental Analysis Group

Stephen T. Margulis
Buffalo Organization for Social and Technological Change

James A. Wise
The University of Washington
Seattle, Washington

WORKSHOP SUMMARY

This workshop addresses the relationships between the statistical standards employed by researchers who generate environment and behavior knowledge and the decisions to use such knowledge on the part of architects and other designers. The presentations by Seidel, Davis/Szigeti, and Archea frame the issue from the empiricist or Neyman-Pearson point of view; the instrumentalist or Bayesian point of view; and the existentialist or Hermeneutic point of view. Then, the key points of consensus and contention are summarized by Margulis followed by an open discussion. The goal of this discussion is to formulate a prioritized agenda for the further analysis of these objectives in a form that addresses the concerns of both the researcher and the designer.

Statistical Significance, Research Usability and Practitioner's Decision Making (Seidel)

This presentation discusses: (1) What does statistical significance really mean? (2) Is information usable by practitioners when the researcher is not able to achieve the p<.05 level of statistical significance? (3) Is the desire for statistical significance at p<.05 antithetical to the way architects, urban planners, and other administrators make decisions? The author argues that seeking this level of certainty before action can be described and taken, while appropriate for knowledge building purposes, seriously inhibits the informing potential of research products for practical decision making. The author presents a model for intelligently and ethically using the results of research to inform professional practice when this information does not meet the researchers' criteria.

A Model of Bayesian Statistical Analysis For Producing Research For Use in Practice (Davis/Szigeti)

This presentation describes strategies for investigation in typical situations in professional practice where the questions to be studied are not understood at the start of investigation and where the issues to be decided can only be defined after the investigation is substantially complete. The authors present their general methodology for such situations and give case study examples of what may be described as a Bayesian approach to data gathering and analysis in environmental design research.

Perceived Risk And The Use of Research Findings in Architecture (Archea)

It is not at all clear that there is any relationship between the use of research findings in architectural design and the level of "scientific" support provided for those findings. This suggests that the applicability of research findings may be less of a methodological issue, as defined by the canons of empiricism, than an issue defined by the existential context within which decisions are made. For example, if the decision maker perceives little or no risk in a decision option, then no level of statistical confidence is likely to influence a given decision. However, if the level of risk is perceived to be very high, then it is quite likely that decisions will be influenced by evidence that falls far short of the researcher's threshold for acceptance or rejection. Some implications of this are illustrated in light of the author's own research on accidents, crime, and behavior during fires and earthquakes.

Applications of Bayesian Statistics to Design Research (Wise)

By accepting the analytical methods of the behavioral sciences, design research has also assumed their inherent limitations. It is argued that foremost among these is the 'classical' Neyman-Pearson approach to statistical inference. This approach, represented by several familiar 'significance tests' (t, F, etc.) construes probability very narrowly,
emphasizes but one type of inferential error, and effectively divorces any decision to be made from the experimental evidence necessary to support it.

The Bayesian approach to inference in experimentation offers a significant advantage over the classical model. Here, probability is seen as subjective degree of belief, and experimental results are used to optimally revise one's opinion with regards to competing hypotheses. The result of an experiment is a direct estimate of the probability that a hypothesis is true given the data - a quantity that is immediately useful and relevant to the process of design development. This presentation will demonstrate the process of Bayesian revision and its application to a few illustrative design problems, as encountered in professional practice.
Freedom and control has been analyzed by adapting Kevin Lynch's spatial rights described in her book A Theory of Good Urban Form (M. J. T. Press, 1981).

These are presence, or access, use and action, appropriation, modification and disposition.

Connectedness taps the historical potentials of a site where history is viewed in a broad sense ranging from the ties of an individual to a place, group ties and then the larger regional or national ties. It is based on the assumption that people need links to the world and that some of these links are provided by the places they inhabit and the resources and activities within these spaces. It also suggests that the design of public places can enhance connectedness.

After a brief presentation of the dimensions members of the panel and the workshop participants will consider these dimensions in light of their own philosophies, perspectives and work. Emphasis will be placed on the design and management of open spaces and implications for the development of public policy.
WORKSHOP SUMMARY

Some people have posited models attempting to explain fear of crime on the part of the average citizen, or special subgroups of the population. Others have been independently working on attempts to explain criminal behavior. Both criminal behavior and fearful behavior may be conditioned by similar environments. Research into which cues are important in both respects may be benefited by more integrated approaches attending to the attributes of specific urban environments and their behavioral consequences. In this workshop, information is shared about ongoing research into specific environments related to both fear of crime and criminal behavior.

Information is shared about ongoing research into the spatial aspects of fear on the part of criminals engaged in fencing operations. It is observed that local environments which vary in their spatial characteristics appear to make criminals more or less at ease in their fencing negotiations.

Similarly, the design of banking establishments appears to provide cues to the would-be robber about the vulnerability of the setting.

Different types of housing, and the social integration of neighborhoods are examined relative to their influence on both the likelihood of burglary and the effect of burglary on the victims.

Fear of crime is examined as an environmental barrier to the elderly in an urban setting; and research into urban environments feared by handgun permit holders is discussed.

Methodologies in the research vary from behavioral observation and videotaping of criminal behavior to interviews and mailed surveys of victims.

Connections among the research from a conceptual standpoint are explored in the workshop with a focus on varying environmental attributes and their relationship to individual behavior - legitimate and otherwise.
ACOUSTICAL CONSIDERATIONS IN ENVIRONMENTAL DESIGN RESEARCH

Annabel J. Cohen
Scarborough College
University of Toronto

WORKSHOP SUMMARY

The workshop provides a forum for discussion of acoustical considerations in environmental design. Acoustical factors are seldom the main focus of environmental design research yet they are often implicated in the results. For example, Seal and Sylvester at EDRA 13, 1982, reported that noise disturbance in office settings elicited the greatest percentage of employees to request a design improvement, exceeding nine other non-acoustical sources of disturbance. Through the use of appropriate building materials, the degree of satisfaction was raised considerably and acoustical privacy was one of the major improvements in the new office design. On the other hand, Kates and Adams, also at EDRA 13, 1982, reported that enclosed "quiet" rooms in an office setting were the least frequented areas chosen by employees as a place of work. Paradoxes such as these in which acoustic quiet is desired in one situation but not another and the fact that technology permits the control of the acoustic environment, warrant a special focus on acoustics in environmental design research.

Annabel Cohen, an experimental psychologist with a background in musical and auditory perception and currently investigating spatial cognitive maps will focus attention on the auditory image of the environment.

Christin Nuttall, a psychologist and applied behavioral researcher from the Facility Management Institute, Ann Arbor, Michigan, will describe some acoustical concerns of clients in work settings.

Lynne Marshall, Director of Audiology of the College of Counseling and Special Education, University of Nebraska at Omaha, will respond to questions on speech intelligibility in noise and special needs of the acoustically handicapped.

Angelo Campanella, an engineering acoustical consultant of Acculab in Columbus, Ohio, will provide information on techniques for altering the acoustical environment and comments on the interaction between the acoustical environment and comments on the interaction between the acoustical consultant and the behavioral researcher, client, and architect. (tentative)

Comments and questions from the audience will be most welcome. It is hoped that guidelines for research objectives in this area might emerge from evidence of recurrent problems and observations in different environmental design contexts.
Cognition and Environmental Use: 5 Case Studies

Jon A. Sanford
Robert Beck
George N. Suther
Robert T. Osgood
David Lewis

College of Architecture
Georgia Institute of Technology

Discussant:
D. Geoffrey Hayward, Director
Environmental and Behavior Center
University of Massachusetts

Workshop Summary

The purpose of this workshop is to apply certain principles of perception to design in order to understand how people evaluate, attach meaning and respond to architectonic stimuli. Although the five studies presented represent a range of issues related to environmental cognition, all are based on the assumptions that perception of the environment will vary according to person, time and place; that perception influences behavior, and that these principles can be utilized to develop design strategies.

These issues raise important questions for the design of human environments. What are the design elements which affect perception and do these vary with time and place? How does perception affect behavior and the way in which an individual can or will use particular environment? What are the design alternatives? The purpose of the workshop is to provide a basis for discussion through which these questions can be explored and through which we can exchange views on the critical issues which affect the relationships among design, perception and environmental use.

Robert Beck will discuss way-finding in subway systems. This case study is based on the hypothesis that the subway rider is cut off from the surface features which urban pedestrians use to determine their location. As a result, he/she must seek other sources of locational information. The study looks at what methods the subway rider uses to navigate within an underground transit system and how effective these methods are. Observations have been made on three subway systems to determine how riders navigation is affected by route layout, station architecture, audio visual information systems.

George Suther will discuss way-finding in airports. Problems of way-finding exist primarily in large scale buildings in which the user has difficulty orienting himself to the overall plan configuration. This study proposes that a major objective of way-finding in large buildings, specifically airports, is based on the model of "cognitive mapping." This idea of mental image in way-finding is a function of signs and numbers, perceptual access, architectural differentiation, and plan configuration.

Robert Osgood will discuss visual access and exposure and its influence on spatial behavior. Using Archea's model of visual access and exposure for predicting human spatial behavior, spaces within a suburban shopping mall have been evaluated to illustrate that individual preferences in the physical environment does not, by itself, provide substance upon which to base design decisions. Rather, design is a function of spatial positioning, which is dependent upon such factors as: the purpose of a place, the intentions of its users, existing social norms and the presence of other people.

Jon Sanford will discuss the cognitive aspects of the design of urban environments. Focusing on the problem of underutilization of urban spaces, this study postulates that spatial use is based on positive spatial image. In addition, image is a function of the presence and configuration of specific design elements which allow a range of opportunities to see and be seen by others. The study utilizes the principles of surveillance opportunity and the potential for visual access and visual exposure as dimensions by which image and use of civic spaces can be evaluated.

David Lewis will discuss architectural symbolism and perception. The use of symbolism is most evident during ideological settings; wherein the process of delivering the ideology is of greater importance than the ideology itself. This presentation examines the 1936 rally at Zeppelin Field where Albert Speer used searchlights to create a 'cathedral of light.' The study uses Benedict's source base isovist and Archea's access and exposure models to analyze the role that the architectural setting played in creating the perception of a synthesis between actor audience and environment.
WORKSHOP ON ENVIRONMENTAL DESIGN ISSUES AFFECTING WOMEN: AN AGENDA FOR THE EIGHTIES

Rebecca Peterson, York University

Susan Saegert, City University of New York

Greta Salem, Alverno College

WORKSHOP SUMMARY

This workshop will focus on defining a research/action agenda of women and environmental design issues for the 80's. Women's needs in environmental design have been addressed in a number of recent publications. Among them are New Space for Women (Wekerle, Peterson, Morley, 1980), Women in the American City (Stimpson, Dixler, Nelson, and Yatrakis, 1981), and The Grand Domestic Revolution (Hayden, 1981). There are other recent books which have also addressed these topics. Among the issues already identified are the needs of single parent families, the needs of women in the home, the effects of suburban and urban environments on women, the needs for daycare in the workplace and the wider urban environment, the effects of transportation systems on women users, the role that women play in environmental decision-making, and alternative designs that might better meet women's needs.

Rebecca Peterson will give an overview of work done to date on environmental design issues affecting women. She will identify areas where research is needed and suggest ways in which these topics might be addressed in the eighties.

Susan Saegert will draw from research she is now conducting on the lives of women in low-income housing cooperatives in New York. She will suggest that from an initial focus on how women control their own dwellings, she has moved to exploring how structures and policies can free women from a commodity-defined form of life.

Greta Salem will focus on the political aspects of the design of space. She will report on work which is attempting to forge a link between the environmental impacts on women's lives and women's skills in political action.

The format of this workshop will be that each of the organizers will first give a

20-minute overview statement. These three presentations will be followed by a participatory session incorporating the views and knowledge of all members of the audience. The two-hour period will be roughly divided half and half between presentations and participation by the audience. By the end of the session the workshop will have generated information which will be transcribed and mailed out to all participants following the event.

References


INFORMATION TECHNOLOGY AND OFFICE DESIGN

Peter Ellis Ph.D.

Francis Duffy Ph.D.
Duffy, Eley, Giffone, Worthington,

Peter Jockusch Dr-Ing, Dept. Architecture
Gesamthochschule, Kassel, W.Germany.

Franklyn Becker Ph.D.
Cornell University, N.Y.

Michael Brill Ph.D.
B.O.S.T.I., Buffalo, N.Y.

Gerald Davis
T.E.A.G., Ottawa, Canada.

Walter Kleeman Ph.D.
Metagraphics Inc., Denver, Colorado.

WORKSHOP SUMMARY

Purpose of the workshop

The aim is to provide a forum for the exchange of information between researchers involved in studying the impact of information technology on the office, and in particular to compare the findings from Europe and the USA.

Format

The first two named authors will make a brief presentation of the results of a major study they have recently completed in the UK, supported by the third author reporting similar findings in Germany. Each of the other participants will then be asked to comment on the issues raised in the light of their own research findings.

Expected outcome

The European findings stress the impact which information technology makes on a series of organisational dimensions, and the effect which these in turn have on the structure, services, layout and design of the office building. These effects are briefly outlined below.

Organisational size IT is causing a proliferation of smaller firms and the division of large organisations into smaller units. This creates a need for building sub-division, separate entrances and autonomous services.

Configuration Workgroups are reducing in size, particularly clerical. Combined with other factors, this is causing a rejection of open plan layout, and increasing emphasis on bounded group spaces with local control over services.

Bureaucracy Advanced IT is associated with reduced bureaucracy and formalisation, and higher levels of lateral interaction. Planning implications of this include an increased need for meeting places.

Flexibility Advanced IT may ultimately bring increased physical stability to the office, but the transition period is marked by severe disruptions and a high need for flexibility.

Boundaries Advanced IT leads to blurring of the boundary between an organisation and its environment. Flexitime, 24 hour working, working from home, and more interaction with other organisations, are some of the factors affecting corporate identity and its physical manifestations.

Organisational culture A trend to greater individualism is characteristic of many organisations with advanced IT, with implications for staff involvement in the planning and design process.

It is expected that discussion will centre on international differences on the above issues, and on the role of design research in understanding those patterns of organisational change which affect the office environment.
PARTICIPATION IN ENVIRONMENTAL 
PLANNING, DESIGN AND MANAGEMENT

Mark Francis
Design and Landscape Architecture
University of California, Davis

Daniel S. Iacofano
Program on Urban Studies
Stanford University, California

Robin C. Moore (contact person)
School of Design
North Carolina State University
Raleigh, North Carolina

WORKSHOP SUMMARY

PREAMBLE

Premises

Every environmental professional engaged in real world development must accommodate some degree of participation by the paying client, beginning with securing the project and negotiating the contract—a point where working styles, relationships and expectations are usually set in place. Even with a small private client, the way in which the initial phase is handled can pave the way for a harmonious, productive working relationship—or a frustrating, time wasting one. With complex organizational clients, whether governmental, non-governmental, or a mix of the two, the structuring of appropriate working relationships is a far more serious matter. Why? Firstly, "professional time" is the scarcest of resources and has to be budgeted effectively in order to survive; secondly, public money is often involved; thirdly, there is an assumption that product quality will be a direct reflection of process quality. Indeed, in the highest quality examples the two can be considered functionally inseparable. Is it possible for a good product to evolve from a lousy process?

Rear View

Beginning with the advocacy planning movement in the sixties a strong distinction developed between "clients" and "users", clients often being considered the villains (developers, urban renewal agencies, highway authorities, etc.) and users the victims (low income neighborhoods). So many hopeless battles of powerful against powerless were lost that citizen control came to the fore. Politics took to the streets, but seldom won.

And then into the seventies, burned out, the end of the war, process was paramount, part of the times. Frequently, unrelenting cynicism or process mania produced little interest in physical results. On the other hand, post construction evaluation developed to bridge the mysterious gap between intention and result in the built environment. Would this after-the-fact intervention by impartial design-research experts pave the way towards environments better adapted to human needs?

An important result was the development of a battery of evaluation methods and instruments which practitioners could use as tools within the planning and design process in addition to using them to evaluate the results. At the quickest and dirtiest level they produced results relevant only to the project in hand, but that was all that was needed.

Present Trends

The dramatic economic shifts of the eighties have forced many former adversaries into the same boat, obliged to row together, even in the same direction, in order to survive; along with the realization that a positive working relationship must exist between all parties—clients, users, investors, managers, etc. with an interest in a particular environmental change if a maximum quality of development is to be achieved. Corporations, partnerships, associations, networks, liaisons, coordinations and other organizational forms have developed to
effectuate such relationships.

How many organizations and actors within and outside of the environmental profession are already using participatory approaches to problem solving as a mainstream management style and strategy?

Quo Vadis?

Where does that leave environmental design researchers? Are there important research questions to be addressed? Is the documentation of different participatory processes as a function of context an important task, so that results can be codified and promulgated to a wider audience? Are the costs and benefits of participation important topics for systematic investigation? Or is the effective dissemination of good case examples more important? Do EDRA members have a role to play, or has participation already become part of mainstream practice and management? What are the residual issues of social/environmental equity?

PURPOSE

Above are some of the broader issues to be addressed by the workshop. More specifically the workshop is for planners, designers, managers and researchers with experience in participation, to share their work and learn from each other:

1. To discuss the concept of action research as a necessary part of the participation process;

2. To review experience in different contexts and settings with specific techniques that facilitate participation and to evaluate their cross-over potential between contexts;

3. To discuss the barriers to participation in professional practice and how they have been/could be overcome. Are successful cases mostly due to the individuals involved, or do institutional structures and organization processes also play an important part?

As much as possible we want to build on the results of a similar workshop held last year at the IAPS conference in Barcelona organized by the convenors of this workshop.

SEGMENTS

1. Preconference
   b. Responses to call collated, summarized and circulated back to responders.

2. Conference Agenda
   a. Techniques market-place--general sharing amongst participants of techniques that work.
   b. Discussion of action research/participation methodologies.
   c. Discussion of barriers and how to overcome them.
   d. Other issues.
   e. Are we a useful network; if so, what next?

3. Postconference
   a. Dissemination of the graphic record of the meeting to all participants.
   b. Other business, as required.
WORKSHOP ON ENVIRONMENTAL AESTHETICS

Organizer:

Jack L. Nasar
The Ohio State University

Speakers and Reactors

Arnold Berleant
Long Island University

Jon Lang
University of Pennsylvania

Werner Nohl
Technische Universität München

Barbara Sandrisser
The Paul Partnership

Jusuck Koh
The University of Georgia

Mit Mitropoulos
Massachusetts Institute of Technology

WORKSHOP SUMMARY

Consideration of the theoretical underpinnings of environmental aesthetics can enrich the questions, solutions and approaches considered by researchers, designers, educators and others in the field of environmental design research. In this workshop, participants will examine theoretical issues of environmental aesthetics in three ways -- formal papers, panel reactions, and audience/panel discussion.

The formal papers in this workshop present a variety of theoretical positions. Included are discussions of the role in aesthetic preference of a person's language and landscape experience, of the nature of the person's sense experience, of nature in urban open spaces, and a discussion of the incorporation of research findings (Gestalt, Transactional, Ecological and other) on formal aesthetics in the Basic Design Class. While distinct from one another, these papers share as common emphasis a concern for conditions which may influence the aesthetic experience people have in the environment, and a concern for the relevance of those conditions to design, research or educational endeavors.

It is expected that the discussion by reactors, panelists and the audience will move towards some consensus on new issues worthy of further research, design, or theoretical consideration. Towards this end, discussion will be steered towards examining the validity of the positions presented, the relationships between them and their relevance to research, design and pedagogic activity.
WORKSHOP SUMMARY

The purpose of this workshop is to present a series of "success stories" where the researcher-practitioner-user gap appears to have been bridged more or less successfully. It is important to confirm that the communication difficulties we are all aware of are sometimes surmounted, and more people-oriented environments created.

The four presentations all deal with professional consulting work, but the clients, settings, time-budgets and approaches differ quite markedly. In addition to telling their story, workshop participants will analyze what it was (process, personalities, method, etc.) which helped this become a "success story." It is hoped that the audience will share their experiences and that, together, we can begin to articulate a framework for successful outcomes in E. & B. consulting.

Clare Cooper Marcus (Workshop Convener) will discuss her role as programming consultant in the re-design of a notorious San Francisco housing project (known locally as "The Pink Palace") into elderly housing. Programming drew on existing research, rather than original data-collection, due to a very brief time-budget. Marcus became an active member of the design-team, assisting in all phases of decision-making from overall goals to tree selection. Translation of research findings into a design program, and the subsequent translation of program statements into physical design will be stressed.

Randy Hester will discuss on-going work in the historic, coastal community of Manteo, North Carolina. A unique approach of determining the "sacred structure" of Manteo, as perceived by its residents, enabled a plan to be drawn up which will guide development as a historic-tourist center, with minimum disruption to its inhabitants' daily life. Hester will focus on methods of protecting the "mundane" functions of a small community via planning regulations.

Russ Ellis will discuss the participatory design of a community park in San Francisco's Mission District. Acting as a mediator/consultant between the complex ethnic mosaic of the community, city government and the design team, he will describe various techniques and accidents which blended community images and ideas into a four and one half acre site. Conflict "management" and the use of graphic and video communication tools in the process will be stressed.

John Zeisel will discuss on-going work in which office environment research is being translated into recommendations for future General Services Administration office design. He will focus on the translation of people-environment research into usable design guidelines.
INFORMATION UTILIZATION IN DESIGN AND MANAGEMENT DECISION-MAKING

Janet Reizenstein
Office of Hospital Planning, Research and Development
University of Michigan
Ann Arbor, Michigan

Craig Zimring
Department of Architecture
Georgia Institute of Technology
Atlanta, Georgia

Christin Nuttall Grant
Facility Management Institute
Ann Arbor, Michigan

Workshop Abstract

In the past, environmental design researchers have bemoaned the low degree of utilization of their work by design decision-makers. Part of the reason for this infamous "gap" is the researchers' persistent focus on the wrong group as the major consumers of design research. The purpose of this workshop is to systematically examine the role of information in design decision-making, with an emphasis on how organizations make design-related decisions, rather than looking only at designers as the focal group.

Christin Nuttall Grant will discuss why corporate and government decision-makers choose to use or not use existing design research information in the design and management of workplaces. Three topics will be covered: what kinds of organizations seem to be most likely to use design research, what kinds of information seem to appeal to them most and how a proposal for using design research is evaluated by decision-makers. Most of the material will be drawn from past experience at the Facility Management Institute and some will be taken from a recent study of facility management practices.

Craig Zimring will describe an analysis of the maintenance-oriented needs of the U.S. National Park Service. After several decades of rapid acquisition of park lands, the Park Service has shifted its emphasis to the maintenance and improvement of existing properties. As part of a comprehensive Inventory and Analysis Program of Park Service buildings Georgia Tech is undertaking a study of maintenance decision-making in order to discover what information is presently used and what additional information is needed.

Janet Reizenstein will discuss how and why information about the design needs and preferences of hospital patients and visitors were or were not incorporated into the final architectural design of a $285 million new hospital. Her study traced approximately 350 specific recommendations made by an applied research/advocacy team during the Schematic Design and Design Development phases of design. This participant-observation study used project documents and extensive field notes to describe each recommendation. The success or lack of success of each recommendation was analyzed as a function of several of its characteristics, the particular environmental issue and the associated decision-making process. Design decision-makers utilizing this information included hospital planners, physicians, administrators and nurses, as well as designers.
A MODEL FOR WORKPLACE RESEARCH

Nancy Cato Kates
Facility Management Institute

Betty Hase
Herman Miller, Inc.

WORKSHOP SUMMARY

Research in the office setting has typically focused on one of four different approaches to answer the question--is there a fit between the behavior of people at work and the setting in which they work?

![Diagram showing Place, Process, People relationships]

Key to Research Approaches
1 Scientific Management
2 Ergonomics
3 Human Relations
4 Person-Environment-Relations

Figure 1. Research Relationships

During the first half of the workshop, presenters will discuss examples of published research under each of the four approaches. For the remainder of the session, workshop attendees will use and evaluate "The Workstation Game," a Person-Environment-Relations method of determining user needs in the workplace.

For the purpose of the workshop, the four approaches to workplace research are defined as:

(1) Process/Place
The scientific management approach, as practiced by Frederick Taylor and Frank and Lillian Gilbreth, was frequently associated with counting work pieces produced in a certain period of time and dividing jobs into their most simple elements. The goal was to improve productivity.

(2) People/Place
The second approach is the ergonomics approach. Research centered on measuring people and their relationships to various aspects of the physical environment. The first studies involved pilots and their reach and sight lines to control panels in airplane cockpits. The studies were then transferred into the automobile "cockpit" and finally to the office "cockpit"--the workstation. The goal was to help an employee work faster by reducing the number of steps to important places in the office and reducing the distance of a person's reach to the work tools needed.

(3) People/Process
The third approach to workplace research is called the human relations approach. The formulation of a hierarchy of needs by Abraham Maslow represents this approach, and the field of organizational development applied the approach to the workplace. The goal was increased worker motivation.

(4) People/Process/Place
The fourth approach appeared in the late 1950s, after work by Kurt Lewin and Roger Barker. Researchers explored relationships of environmental and job factors that influence the behavior of workers. Included in these factors were the job level of the worker, the type of work done, and the effect of the environment. This approach has been a primary emphasis of EDRA. The goal is to increase the fit between the person and the social/physical environment--or a culmination of the previous three goals.

"The Workstation Game" is an example of a research technique from the fourth intersection in the model. Workshop attendees will be asked to "play" the solitaire game, designed to elicit employee participation in a design programming process at a particular company. Workshop attendees and presenters will discuss possible ramifications of the programming decisions made by social scientists compared with choices made by the employees in the case study.
INTERNATIONAL HOUSING RESEARCH NETWORK

James R. Anderson, Organizer
Housing Research & Development and
School of Architecture
University of Illinois

Sue Weidemann, Organizer
Housing Research & Development Program and
Department of Landscape Architecture

WORKSHOP SUMMARY

Purpose

At the 1982 annual EDRA (EDRA 13) conference, participants from Australia, Canada, England, France, Holland, South Africa, Sweden and the United States met to discuss research about the quality of housing environments. That meeting focussed on evaluations of housing from the perspective of the residents, and the potential for cooperative international research was considered. Participants presented examples of housing evaluations from their own countries; as a result of this 1982 meeting, an international housing research network was initiated and a newsletter begun.

During the summer and fall of 1982 various members of the network were able to meet at the International Conference on People and Their Physical Surroundings (IAPS), the International Applied Psychology Conference (IAAP), and the International Sociological Association (ISA). These meetings were very useful, and strong interest was expressed for a continuation. The purpose of this international housing research workshop was to continue the exchange of information begun at EDRA 13.

Format

Specific objectives were to: 1) encourage the addition of new members to the network; 2) provide an opportunity for participants to present information about research evaluating the quality of residential environments in their own country; 3) consider opportunities and implications of conducting comparative cross-national research; and 4) discuss procedures for the continuation of the International Housing Research Newsletter.

Presenters include:
Irwin Altman, University of Utah, USA;
James R. Anderson, University of Illinois,
Graeme J. Hardie, National Institute for Personnel Research, Johannesburg, South Africa;
Roderick J. Lawrence, Ecole Polytechnic Federale de Lausanne, Switzerland;
Kenneth McDowell, University of Saskatchewan, Canada;
Diana Oxley, University of Utah, USA;
Hazel Shore, Security Pacific National Bank, California, USA;
Sue Weidemann, University of Illinois, USA;
Carol Werner, University of Utah, USA;
David Stea, University of Wisconsin-Milwaukee, USA.
METHODS OF HOUSING EVALUATION:
PERSPECTIVES ON ALTERNATIVE TECHNIQUES

PARTICIPANTS

Sue Weidemann, Organizer
Housing Research and Development Program
Department of Landscape Architecture
University of Illinois, USA

James Anderson, Organizer
Housing Research and Development Program
School of Architecture
University of Illinois, USA

Irwin Altman
Department of Psychology
University of Utah, USA

Graeme Hardy
National Institute for Personnel Research
South Africa

Roderick Lawrence
Department of Architecture
Ecole Polytechnic Federale
Switzerland

Kenneth McDowell
Department of Psychology
University of Saskatchewan
Canada

Diana Oxley
Department of Psychology
University of Utah, USA

Carol Werner
Department of Psychology
University of Utah, USA

WORKSHOP SUMMARY

Purpose

Research evaluating the quality of the residential environment has utilized a variety of techniques of measurement which, in turn, have been directed toward a number of dimensions of the housing environment. Figure 1 illustrates this general matrix. This workshop was intended to offer an opportunity for the comparison of some of these methods of obtaining information about housing environments.

Participants in this workshop were asked to present examples of the use of one of these methods, and to discuss the variables, within the dimensions of the environments, which they were intended to measure.

In presenting these examples, participants were asked to describe 1) the "theoretical network" within which their conceptual variables are contained, 2) the procedures for using their technique, 3) the methods analysis used for the information obtained by the technique, and 4) an evaluation of the relative advantages and disadvantages of their approach. Methods scheduled for consideration were self-reported mailed questionnaires, structured interviews, user participation, and thermography (instrumentation).
Expected Outcome

Information exchanged within this workshop should further an integrated understanding of the nature of the dimensions of the residential environment, as well as the means by which the environment is evaluated.

<table>
<thead>
<tr>
<th>Methods</th>
<th>Physical Variables</th>
<th>Social Variables</th>
<th>Institutional Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self reports</td>
<td>1 . . . n</td>
<td>1 . . . n</td>
<td>1 . . . n</td>
</tr>
<tr>
<td>Instrumentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archival Records</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Observation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Methods by Measures Matrix
WE'VE LOOKED AT BOTH SIDES NOW: A WORKSHOP
OF THE DUAL-EDUCATED

Robert B. Bechtel (Chairman)
University of Arizona

D. Geoffrey Hayward
University of Massachusetts/Amherst

Jan Reizenstein
University of Michigan Hospital

Jay Farbstein
San Luis Obispo, California

Min Kantrowitz
Albuquerque, New Mexico

Gary T. Moore
University of Wisconsin/Milwaukee

WORKSHOP SUMMARY

The workshop consists of four speakers and a discussant who will address the issue of dual degrees in environment and behavior research. Each participant is a professional with two degrees, one in design and one in research. Geoffrey Hayward is an architect and a social scientist. Jan Reizenstein, trained in sociology and city planning, is now earning her Ph.D. in Sociology & Architectural Research. Jay Farbstein, a Ph.D., is president of his own architectural firm. Min Kantrowitz runs her own design and research firm. Gary Moore directs the U. of Wisconsin's Environment-Behavior Research Institute. Each will consider whether dual education has made them more employable than a person with a conventional education, whether it has been useful in the work they have done, and whether they would recommend it for all, some, or none of the people who want to do E&B research. The workshop will be useful for educators in E&B research to evaluate the field record of these dual-educated people, for students wanting to know whether a dual education is worth the price, and for potential employers of such people.

Geoffrey Hayward. Dual education began, for me, as a way to an enlightened design practice, but eventually it changed my career path toward one in research. That shift meant a more limited job market, however, because I had become more selective about where to use my skills. In my work, dual training has led to a redefinition of my professional role. Whereas architects are trained to act as head of a team, I now work with people, in multidisciplinary collaborations. To understand how well environments work for people, some dual education is essential. The question is - how much? Depending on the person, it might mean a few courses, an M.A., or a Ph.D. and at any level, it should include an actual team work project.

Jan Reizenstein. I feel that my education in both social science and design increased my initial employability and combined with resulting job experience has led to continued employability. Dual education, along with research and design experiences, is perceived by potential employers as rather unique and as something that testifies to the applicant's credibility and commitment to the field. I would recommend sequential education in both research and design, rather than simultaneous training.

Jay Farbstein. It is essential for anyone practicing our kind of person-based programming and evaluation to understand both areas. This is more a question of attitudes, orientation, and values than of high level technical performance in either area. Our people are not outstanding psychologists or great designers, but they are excellent at what they do.

Min Kantrowitz. Does a dual education leave one being "both" or "neither"? Does one synthesize a new approach or use a combination of existing ones? What are the real benefits AND the real costs of dual education? Does it leave one "a woman without a country" or does one need a country in E&B research? I will reflect on my own experiences at self definition, marketing, and client education.
The presenters-stimulators in this session are behavioral designers who operate in the micro-environment and who also adequately measure the results of their designs in terms of user satisfaction. They represent among them the disciplines of architecture, building technology, interior design, interior ergonomics, environmental psychology, human factors engineering and social science analysis.

The session consists of short, concise reports on current work followed by discussion among the presenters and the audience.

Presenters and their topics are:

John Archea, Architectural Research, Georgia Institute of Technology, Atlanta:

Effects of Visibility on Users' Experiences in Civic Spaces, a study funded by the National Endowment for the Arts.

Mike Brill, Buffalo Organization for Social and Technological Innovation (BOSTI) Inc.:

Everyman as Designer - A Different Design Process Where Everybody Is His/Her Own Designer

Yvonne Clearwater, Bechtel Civil & Minerals, Inc., San Francisco, CA:

Maximizing Human Performance and Quality of Life in Unusual Environments: Arctic and Desert Communities, Long Duration Space Flight, Oil Tankers, Offshore Drilling Rigs and Submarines

Min Kantrowitz, Min Kantrowitz and Associates, Albuquerque, NM:

"The issue of automatic versus user control of energy conserving building components is a controversial one. Data from a variety of sources points in opposite directions but the theory of learned helplessness may partially explain the dilemma."
STATE OF THE ART OF POE: LESSONS FROM
THE FLORIDA A&M SCHOOL OF ARCHITECTURE
COMPETITION

Rich Wener
Department of Social Sciences
Polytechnic Institute of New York

Edward White
School of Architecture
Florida A&M

Gerald Davis
TEAG
Ottowa, Canada

WORKSHOP SUMMARY

Florida A&M University recently (Winter, 1983) issued a Request for Proposals for
Post Occupancy Evaluations of the new
School of Architecture building. This
RFP was unique in three respects: 1) this type of competition is rare, if not
unprecedented for post occupancy
evaluations; 2) the RFP included moni-
toring of design decisions and modific-
ations throughout the construction phase
of the project; and 3) the RFP included
plans for comparison evaluations of five
other new facilities. Nineteen proposals
were received from which five finalists
were selected, and finally, a "winner"
was chosen.

The competition provides an unusual oppor-
tunity to learn about the state of the art
of post occupancy evaluation. Professor
Edward White, from the Florida A&M School
of Architecture, will describe the
criteria used for evaluating proposals,
and the range of concepts, ideas and
interpretations in the proposals they
received. Gerald Davis will serve as
discussant.
BEHAVIORAL DEFINITION OF PUBLIC SPACES: A STUDY ON TWO UNIVERSITY CAMPUS SETTINGS.

Prataap Patrose
S.M.Arch.S. student, M.I.T.

POSTER SUMMARY

The poster is a descriptive photodocumentation study on the nature of open space use on two university campuses, one in India (S.P.A. New Delhi) and the other in U.S.A. (M.I.T.). The study's primary focus is on observing the territorial definition given to public spaces through spatial behaviors that make use of the following:

i. distancing spatially between architectural elements and other users.
ii. use of physical/non-physical 'support' elements.
iii. degree of visual control possible, over changes in the environment.

These behaviors allow a user to select a spatial enclave (Pfeiffer, 1980) that best suits his/her role intentions (Goffman, 1961; Palmer, 1981) in the space. The study raises the hypothesis that these variables influencing spatial behavior are cross-culturally (1) valid. And as variables, they are used in varying degrees and combinations to produce different or similar behavioral patterns in the use of public spaces.

FORMAT

The poster shall be presented as panel exhibits with the aid of photographics, graphics and brief texts.

SCOPE OF EXPECTED DISCUSSION

The poster session shall attempt to raise hypotheses and methodological questions, rather than conclusions, on the basis of the study.

Footnotes

1. The influence of culture specific normative behavior on the nature of space use is outside the scope of this study.

References

Pfeiffer, Toni Sachs. 'Behavior and Interaction in Built Space' in Built Environment vol6 No.1

Goffman, Erving. 'Role Distance' in Encounters: The Bobbs-Merrill Co.Inc. 1961

PARTICIPATORY PLANNING FOR MORE EFFECTIVE CORRECTIONS FACILITIES

Mark Goldman and Jay Farbstein

Jay Farbstein & Associates, San Luis Obispo, California

POSTER SUMMARY

Billions of dollars are being spent on jail and prison facilities and many more billions are expended to operate them. Also, because of the immense "captive audience," jail design is more likely to impact behavior than are other building types. Yet, the planning that precedes construction, and the evaluation that follows, is often ad hoc and inadequate.

In an effort to improve the jail planning process and, as one result, improve the jail environment for its users, we produced a series of Corrections Planning Handbooks. This poster session shows and highlights parts of the Handbooks that address three questions: why is corrections planning needed; how is good corrections planning done; and what are behavior-based design objectives of corrections facilities. Captioned illustrations, including sketches, tables, cartoons and flow charts, attempt to answer these questions.

Why Is Corrections Planning Needed?

Most jails and prisons are antiquated and overcrowded. In most states, new facilities cannot keep pace with the increases in inmates. Many facilities are overcrowded the day they are opened; some cannot be expanded; others are extraordinarily costly to operate -- by their design. Because corrections facilities are one of the most expensive building types to build and operate, as well as one of the most difficult to properly design, remodel, and expand, good planning is critical.

How Is Good Corrections Planning Done?

First, it must be recognized that buildings are not the only solutions to increases in the number of people committing crimes, the number of people being sentenced, and the length of sentences. The number of inmates is a product of many factors, some of which can be controlled -- such as with pre-trial release mechanisms and alternative sentencing programs. Proper planning involves a large and diverse group of participants, including jailers, judges, mental health professionals, citizens and, perhaps, ex-offenders. These people compose a planning team, an advisory committee and task forces -- each providing input on particular issues. Based on numerous facts and assumptions, numbers of inmates are projected over a twenty year or so planning period. These are subdivided by category (such as sentenced females, violent drug addicts). Inmate projections need to be updated throughout the planning period. Space projections are based on the capacity projections, and include adjacency requirements and amounts of different types of spaces needed to be added through the planning period. Planning should be followed by detailed programming, design, construction, occupancy, evaluation, continued planning, and so forth.

What Are Behavior-Based Design Objectives of Corrections Facilities?

A jail must be designed so that it satisfies objectives and priorities of the local corrections system, as well as state and national standards. Many common design objectives are behaviorally based and consider what is best for the staff, inmates, and other facility users. These include facilitating surveillance while enabling privacy, relating to human scale, segregating various categories of inmates from each other, and providing areas for constructive activities and recreation.

Reaction

Although this poster session answers some questions, it is hoped that it will stimulate considerable comment and debate. Is the corrections facility planning process applicable to planning other building types? Should the inmate have a role in planning jails and, if so, what sort of role? Who is the jail designed for? If one objective is to meet the human needs of the inmates, can the environment also serve as a deterrent to recidivism?
DIMENSIONS OF SOCIAL BEHAVIOR MAPPED IN COLOR
Charlan L. Graff
Child & Family Research Institute
Purdue University
West Lafayette, Indiana

POSTER SUMMARY

The primary map of the everyday-life-world is represented in the house. Families map social behaviors for their members in the layout and furnishing of rooms with colors used to code dichotomous categories on dimensions of: (1) group membership—exclusion or inclusion; (2) activity—work or leisure; and (3) role—masculine or feminine. Typical or traditional patterns are likely to produce centralized family interaction, and non-traditional or unique patterns are more likely to produce random or dispersed behaviors.

These propositions were investigated with data which were obtained from a clustered probability sample of middle-class families (N=109) selected to represent homes of early-adolescent boys and girls (ages 12-14). The houses were located in a pie-shaped wedge within a 30 mile radius from a midwestern metropolitan center and represented neighborhoods ranging from rural to urban to suburban in density and organization. Mothers described their houses, the position of rooms in respect to other rooms and the color scheme used in each room. Fathers, mothers and adolescent children rated the frequency of room use for selected activities.

Information concerning the social dimensions of behavior is assumed to be coded in the layout of rooms as follows. Private rooms such as bedrooms signify separation or exclusion and provide a place for either solitude or the development of intimacy. Rooms that are accessible to all family members indicate inclusion; and rooms for the reception of outsiders (e.g. the living room) denote temporary inclusion within the family group. In the informal or "backstage" area of the house, the kitchen is the place for work; and the family room is equipped for play, or relaxing tensions developed in other more stressful activity. Cues for the active and passive characteristics of masculine and feminine roles are displayed in the decor of boys' and girls' bedrooms.

The results of the survey (summarized in poster charts) show differences in color schemes corresponding to differences in position and designated use of rooms.

Modal colors, seeming to code the dimensions of social behavior, parallel contrasts visible in nature or in physical phenomena. Inclusion in the group is signified by green and exclusion by blue repeating the contrast at the horizon as well as the symbolism of the grass-covered ground below with flight into the expanse of the sky above. Reminiscent of the differences in activities illuminated by the light of the sun and the glow from the fireside, yellow in the kitchen corresponds to the work of the home, and the orange and brown decor of the family room indicates relaxation from regular activity. The opposition of masculine and feminine sex roles is reinforced by the choice of colors from opposite ends of the visible spectrum of light which also refer to energy differences. High frequency blue is used in boys' rooms (also in parents' bedrooms) and low frequency red (or pink) in girls' rooms. However, in approximately one-fifth of the homes, a girl's room was reported to be yellow instead of one of the sex stereotyped colors; and in those homes, the adolescent child was less likely to report a preference for rooms used in family interaction.

Further interpretation of the findings will benefit from discussions of the transmission of color-coded messages in various information systems, e.g., physical, perceptual, linguistic and cultural, with implications for behavior at personal, familial, or societal levels of organization.
ENVIRONMENTAL DESIGN EDUCATION: CHANGING EXISTING SITUATIONS INTO PREFERRED ONES

Scott Danford

State University of New York at Buffalo

POSTER SUMMARY

Design is a systematic way for bringing about change to improve a situation. Based upon this definition, a designer, quite simply, is a person who brings about this betterment - a change agent or interventionist intent upon reducing discrepancies between the status quo and some ideal. Despite the fact that the design professions employ seemingly quite different means to achieve their various changes and resultant improvements in the wide variety of environments with which they deal, it can be argued that there are basic commonalities, a basic conceptual core which they share. Those commonalities are masked, however, by our frequent failure to recognize how many professions fit this broadened definition of a designer - not only architects, engineers, interior designers and planners, but also lawyers, doctors, corporate managers, et cetera. They are all professionals intent upon changing existing situations into preferred ones. Although traditional means vary, their shared end of bringing about change for the betterment of the varied environments with which they deal make it reasonable to expect there to be fundamental concerns which they have in common - a basic conceptual core.

Environmental Design education at SUNY-Buffalo attempts to deliver that basic conceptual core - providing a solid, pre-professional foundation to support subsequent professional education and/or career placement in a large number of these design fields. Identifying commonalities based upon the shared real world, intervention-oriented, problem-solving nature of these design professions, this two year sequence of courses focuses on seven elements which it suggests represents this conceptual core. These seven elements provide students with those pre-professional capabilities and understandings which provide the foundation upon which the design professions are based:

1. Conceptualization - an ability to understand the complex transactional nature of the situation being addressed;
2. Inquiry - an ability to gather/obtain useful information about that situation;
3. Analysis - an ability to determine from such information the essential nature of that situation and the relationships of its component parts so as to identify points/features of the situation in need of improvement;
4. Problem-solving - an ability to identify means for achieving such improvements;
5. Synthesis - an ability to combine those several means into an overall, internally coordinated design solution;
6. Communication - an ability to give expression to those needed improvements and the changes required to achieve them; and
7. Intervention - an ability to bring about those changes in real world situations and thereby reduce the discrepancy between that status quo and the design ideal.

To further enhance and refine students' preparation for specific design fields, these seven elements are rooted in a program structure requiring not only an additional sequence of required career specialization electives which focus on the student's chosen design field, but also a third sequence of four semester-long practicum experiences (i.e., community service, research-based, faculty supervised design projects) in which students have the opportunity to apply what they have been learning in their core and specialization courses.

Whether as a basic freshman-sophomore sequence leading into a professional baccalaureate design degree, or as a junior-senior pre-professional degree program providing a foundation for the first professional graduate design degree, or even as a terminal baccalaureate degree providing applied problem-solving credentials for immediate career placement, Environmental Design education based upon this seven element conceptual core produces a quality educational product with multiple career options and an undergraduate foundation which is less subject to creeping obsolescence. There will always be situations in need of betterment. There will, therefore, always be a need for individuals who can make that betterment happen. Such is the product of Environmental Design education at SUNY-Buffalo.
INFLUENCE OF IMAGES OF HOME IN TELEVISION ON CHILDREN

Jerome Tognoli and Francine Hornberger
C.W. Post Center of Long Island University

POSTER SUMMARY

This session reports on a study of the influence of television programs depicting traditional or non-traditional household sex roles on children's play activities, career aspirations and attitudes about the home. Our concern is to demonstrate that the images of home depicted on television can influence viewers' attitudes and behaviors.

Previous research has shown that sex bias in television programming is common (Tognoli and Storch, 1980; Sternglanz and Serbin, 1974), with female characters being located more often inside the home than males, who were more frequently seen in their place of business. Women were usually not portrayed as having careers. Although there are studies which show a direct link between television viewing and subsequent sex typed behavior, none of these has centered on the home in particular. It was predicted that children who viewed a set of programs with traditional formats with regard to household roles would later display more sex stereotypic attitudes and behavior regarding play activities and attitudes about careers and home than those who viewed a non-traditional format.

The procedure involved showing of either of two two-hour video tapes of children's television programs to 34 six to eight year olds. One tape represented traditional and the other non-traditional views of men and women with respect to household roles and work outside the home. Before/after measures were taken of the children's attitudes toward play preferences, career aspirations, and home and household roles.

Data indicate strong sex differences. For example, most of the traditional programs were favored by the boys and the majority of the non-traditional programs were liked by the girls. Also, data suggest that setting can alter the judgments children make of gender/occupation links after viewing particular television content, but more specifically that non-traditional settings seem to reduce children's tendencies toward stereotypy, particularly among girls.

This poster session includes a display of photographs of the data gathering involving the experimenter in the children's homes. Photographs also show samples of the videotaped materials with representative scenes from the traditional and non-traditional formats. Aside from the inclusion of a short history of the research literature dealing with media, sex roles and the home, data are displayed according to the variables described above. Handout summaries of the data will be made available.

It is hoped that by displaying the variety of contexts in which home is presented through television, additional ideas might be generated regarding how home and sex roles might be studied in the television medium. Also, implications for social change will be explored by seeking out how the data and methodology could be utilized by advocacy groups such as Action for Children's Television.

References


ENVIROMENTAL ART

C. Patrick Rowan
Associate Professor-Art, University of Nebraska-Lincoln

POSTER SUMMARY

The purpose of the poster session is to afford Advanced Drawing and Design students enrolled in the Department of Art, University of Nebraska-Lincoln, during the spring semester, 1983, the opportunity to present their collective perceptions of environmental design and research. Historically, the professional artist has had an abiding preoccupation with the design and construction of both interior and exterior environments. The artist is intimately involved in the process of attempting to resolve the ongoing human need to order the environment physically, to reflect inherent human concepts. This involvement in shaping human consciousness with respect to the physical environment therefore assumes a role for the artist in all areas of human planning including urban design, architectural design, landscape design, interior design and fashion design. Generally, the environmental artist is concerned with the design of processes to create new environments in ways that will enhance human life. Specifically, the art students involved in this presentation deal with a variety of themes including Community Planning and Psychology, Human Behavior in Both Public and Private Spaces, The Design of Educational and Recreational Environments, Creation of Environmental Images and Forms Utilizing New Technology, Directed Toward the Development of New Perceptive Awareness of all Human Senses, Consideration of People as Environmental Elements, and Energy Related Concerns including the design of new transportation systems. The significance of this presentation is the artist's involvement and concern for the development of an appreciation necessary to satisfy individual receptive capacity essential to a deepened and widened sense of life. The format of the poster session is a presentation of visual models (original student works), including drawings in a variety of media, photographs, notes, maps, letters and maquettes documenting the students' concerns as outlined above. The presentation is intended to be informational and educational, as well as an exposition of aesthetic ability and conceptual capacity.

The student's expectations regarding reactions generated by the presentation are inherently optimistic and reflect a deep-rooted concern for future universal, environmental development. Furthermore, the student's response and sincere desire to express this concern represents and reflects a renewed orientation on the part of this generation with respect to the future of environmental design and research. The artist's profound sensibility, enthusiasm and conviction challenges both present and future leaders to provide new, accessible opportunities for collective experiences within the realm of environmental art and design, with respect to societal needs.
A MODEL OF FACTORS INFLUENCING THE
RESIDENTIAL LOCATION OF FEMALE HOUSEHOLDERS

Christine C. Cook
University of Minnesota

POSTER SUMMARY

The urbanization of the population which has occurred throughout the last century is well documented. Researchers continue to identify factors which influence the locational decisions among families and individuals.

Using 1980 census tract data, a model of factors associated with the residential location of female householders was developed. This path model was developed to test the hypothesized relationships among the variables, tract distance from the central business district, proportion of structures built prior to 1950, tract density, urban/suburban tract designation, median contract rent, proportion of householders over 65 years and proportion of black households per tract.

Separate analyses were conducted for several groups of female householders: all female householders; one person female householders, female householders with one or more children under 18 years present and nonfamily female householders. The results of the path analyses, which lend themselves to visual presentation, will be displayed for conference participants to examine.

Informal discussion will focus on 1) differences and similarities among the results of the path model for all female householders, one person householders, family householders and nonfamily householders; 2) census data as a means to test locational models - strengths and weaknesses; 3) factors associated with residential location not employed in this study and 4) potential new research directions on female householders and housing choice, opportunity and related issues.
UNDERSTANDING LITTERING BEHAVIOR: THREE FIELD STUDIES

Brian Bienn and Perry H. Prestholdt
Louisiana State University

POSTER SUMMARY

The purpose of this poster session is to describe a series of three field studies conducted at a large southern university. This research was designed to investigate the litter problem and to provide information necessary to reduce littering behavior.

Study One

Initially, an anti-littering awareness campaign was conducted to increase students' awareness of the litter problem on campus. Four heavily-littered campus areas were targeted and baseline litter counts were conducted for two weeks prior to the introduction of the awareness phase. This mass-media campaign, based in the student newspaper, consisted of the following: 1) an anti-littering slogan contest, 2) articles describing the problem and its apparent financial burden, and 3) a daily specific feedback component which reported the litter count for one target area on a number of successive count days. Posters will display the material used in this campaign. It was hypothesized that the general awareness campaign would reduce litter rates in the targeted areas and, more specifically, that feedback would be most effective in reducing litter levels in the specifically targeted area. Time series analysis revealed no significant decline in litter levels as a result of any intervention. However, data collection did lead to the observation that the majority (55%) of the littered items originated in campus snack bars.

Study Two

The observational study which followed examined factors related to a person's disposal or littering of snack bar items. One hundred-six patrons leaving the snack bar possessing litterable items were randomly selected and unobtrusively observed until the item was either properly disposed of or littered. It was found that litterers and non-litterers didn't differ on any demographic characteristics other than sex; males littered more than females. But, more importantly, only a minority (17%) of the subjects actually littered. This finding raised the question of how these students differed from non-litterers.

Study Three

The final study attempted to identify the differences between litterers and non-litterers by examining the role of cognitive variables in littering behavior. It was expected that the two groups would differ on the following measures: awareness of consequences of littering behavior, ascription of responsibility for this behavior, degree of identification with the university, awareness of littering behavior on campus, and strength of anti-littering norm.

Students on campus holding litterable items were randomly selected and unobtrusively observed until the item was either properly disposed of or littered. The subject was then approached by the researcher and was requested to complete a questionnaire measuring the above constructs. Questionnaires were completed by 55 litterers and an equal number of matched non-litterers.

As hypothesized, non-litterers held significantly stronger anti-littering norms and also reported significantly stronger feelings of identification with the university environment. However, contrary to expectations, litterers were significantly more likely to have observed littering behavior on campus than were non-litterers. These results will be presented in graphic and tabular form. Findings suggest that the behavior of non-litterers is controlled by internal standards, whereas the behavior of litterers is more under the control of external cues such as the behavioral models provided by other people's littering.

The presenter will be in attendance to facilitate expected discussions concerning the effectiveness of awareness campaigns and the development of more powerful litter-control techniques.
Research- and experientially-based information on a wide variety of housing options and related topics is being proliferated. However, researchers and practitioners as well as laypersons frequently are unaware of existing information or knowledgeable resource people unless they are part of a housing options network or are served in some way by a clearinghouse on a topic of interest.

While North Carolina is experiencing "Sun Belt" growth and now ranks 10th in population, its population is concentrated in a few areas and much of the state is made up of rural areas and small towns. Urban solutions, such as storefront referral centers (Gould, 1981), to information dissemination problems are not viable in many of North Carolina's counties.

However, the North Carolina Agricultural Extension Service's system of Specialists and Agents has a reputation, especially in rural areas, of being able to provide up-to-date, research-based information and answer questions or refer county residents to someone who can. (Home Economics agents are responsible for planning programs and other information dissemination activities on housing topics, among others). Historically, the Extension Service has relied on face-to-face and hands-on educational strategies to disseminate information. In addition, rural families traditionally have been its primary audience. The future of the Extension Service may depend upon its ability to use emerging technology as an education/information dissemination tool and to broaden the base of people it serves to include non-farm families and young adults (Christenson, and Warner, 1982).

PURPOSE AND FORMAT

The focus of this poster session will be a housing options information package being developed for dissemination to and evaluation by laypersons and practitioners in mid-1983. The information package will consist of a slide/tape presentation intended to heighten laypersons awareness about the nature and scope of housing options (social, design and economic) in North Carolina, and a microcomputer-assisted retrieval program to identify resource people in the state who are engaged in professional activities tied to these options. The purposes of the session will be: share the presenters experiences in developing and implementing this package; present portions of the package in the context of North Carolina's social geography and settlement patterns; and discuss the package itself as well as the impact of emerging technology on information dissemination to laypersons and practitioners. The presenters will welcome detailed discussions, yet much of the presentation will be self-explanatory and/or self-sustaining (graphic panels and slide presentation), permitting conference participants to "take a quick look."

EXPECTED OUTCOME

The presenters hope to accomplish several things through this session. First, they would like for participants to react to the conceptualization of housing options, as well as the data collection methods and dissemination strategies. Second, it is hoped that the presentation will attract conference participants with an interest in housing and/or emerging technology and serve as an impetus for indepth discussion on these topics. Third, the presenters want to heighten EDRA members awareness of the existence of the Agricultural Extension Service (Cooperative Extension in some states) and its potential as a vehicle for reaching the general population.

References


COMMUNITY - UNIVERSITY INTEGRATION THROUGH PARTICIPATORY DESIGN

George E. Temple, IV  
James K. Weeks

Department of Architecture  
Carnegie-Mellon University  
Pittsburgh, Pennsylvania

POSTER SUMMARY

In the design of a community service building, it is vitally important to understand the needs, wants and desires of the user, and to effectively communicate positive behavioral environments through the design. In this session, a participatory process utilized in the joint design study between university students and a community emphasizes the significance of useful techniques and methodologies in effective design communication. The understanding of the process and its influence upon the awareness of students and community members begins to 'bridge the gap' between designer, client and user. Hence, a designer's awareness can accomplish a more responsive humanistic design solution.

The session is complimented by original student/community research, graphically illustrated. This study was augmented by a three-day workshop conducted by David Canter, from the University of Surrey, England, and addressed social and psychological issues related to architecture. The process is documented by slides and a presentation brochure of design development.

Discussion is focused on the process of achieving increased behavioral awareness as it is generated from social, psychological and architectural issues, and the implications upon design.

REFERENCES

Jay Garrott, Peter Burgess  
Professors of Architecture  
Carnegie-Mellon University

David Canter, Professor  
University of Surrey, England

The Squirrel Hill Urban Coalition  
Pittsburgh, Pennsylvania
ECOSYSTEM: A CITIZEN PARTICIPATION SIMULATION GAME

Ronald G. Phillips
Frank W. Hyde
Barbara Rose Bonanni

Department of Architecture
Kansas State University

ECOSYSTEM was initially developed in the architectural design studio as a means of obtaining relevant design information from small town community residents. It was further refined to include an educational vehicle through which the participatory process could examine alternative strategies for establishing an ecologically sustainable community. The game is intended to increase community sensitivity to the physical environment, to identify the meaningful roles citizens can play in contributing to a sustainable community, and to illustrate the potential for increasing one's quality of life through community participation.

The game provides rewards and penalties based on one's level of participation and type of participation. The system of assessment is illustrated in Figure 1.

![Level of Participation vs Type of Participation Table]

**FIGURE 1: Reward and Penalty Assessment**

The game is structured around a seasonally partitioned playing board. Players can change both level and type of participation at various junctures of the game. Individual citizens move tokens corresponding to their respective level of participation. A single token represents: a) an individual, b) a small group (2-5 persons), or c) a community (6+ persons).

The game board is divided into a series of spaces and paths on which the players encounter crises with short and long-term ecological consequence. The spaces on the paths simulate daily community life. They are based on physical, social, educational and economic values found in the existing community.

The display contains the goals and objectives of the ECOSYSTEM game, a slide presentation of the game being played in several small communities in Kansas, the game board, and the results of the gaming experience in the small town context.
IMPACT OF ENVIRONMENT ON SOCIAL AND ACTIVITY BEHAVIOR IN PUBLIC HOUSING FOR THE ELDERLY (1)

Thomas O. Byerts and Tamar Heller
University of Illinois at Chicago

David E. Drehmer
DePaul University

POSTER SESSION - PURPOSE

This study compares patterns of social and activity behavior observed in the common spaces (lounges, laundry rooms, corridors, etc.) of 11 apartment buildings for the elderly administered by a major midwest housing authority (HA). Such findings are needed to direct micro-environmental design, administrative and programming policies to optimize scarce resources. This is particularly critical in elderly housing since the environment plays an increasing role in shaping behavior and limiting options as people advance in age and infirmity. Helping older people remain active and socially engaged can serve to postpone negative outcomes and improve the quality of life.

FORMAT

Intricate relationships between issues such as building size and configuration; programs and services; and resident demographics have been analyzed. Architectural spaces and patterns of behavior are presented graphically on the poster to facilitate understanding of the findings and implications.

Sample and Method

Five of the 36 urban sites containing 52 buildings administered by the HA were selected at random. Ten buildings are located on these sites -- one on one site, two each on three separate sites, and three on another site. A sixth site with a new congregate facility was added since it is the focus of an intensive longitudinal study by the authors. The total sample contains 1642 one bedroom apartments ranging from 85 to 407 units per site. Buildings vary in occupancy from one to 18 years, contain from 85 to 203 units, rise from six to 20 stories, and range from nine to 27 units per floor. Eight of the buildings are rectangular with double loaded corridors, one is "T" shaped and the other two are square "point block" designs. Five buildings offer voluntary weekday noon meal programs. Administrative and common spaces differ widely across buildings.

Detailed social, administrative and environmental data were collected. The primary field research technique used was behavior mapping based on the work of Lawton and colleagues at the Philadelphia Geriatric Center. Every two hours from 10 am to 6 pm during the third week in October 1982, "snapshot" sweeps were made recording patterns of social and activity behavior occurring in each of the study buildings. Social behavior is defined as people actually engaged in conversation while activity behavior includes people engaged in activity without conversation.

EXPECTED OUTCOME

Preliminary findings about per capita patterns of social and activity behavior in the buildings indicate the following:

- Behavior patterns in buildings are heterogeneous even on multiple building sites administered by the same manager;
- Among buildings with meal programs, larger buildings showed less behavior in activity spaces than smaller buildings;
- Among buildings without meal programs, larger buildings showed more behavior in activity spaces than smaller buildings; and
- The amount of behavior observed in activity spaces of smaller buildings varied widely (either high or low) but in larger buildings was similar (moderate).

These and other findings will be presented at the poster session to stimulate critical discussion and identify directions for future research which will hopefully lead to better informed decision making by designers, administrators and policy makers.

1. This study is funded in part by The Retirement Research Foundation.
POSTER SUMMARY

This presentation is meant to draw attention to the eventual use of the computer and its adjacent facilities (i.e. plotters and automated drafting) in the design studio. The subject matter presented in this poster deals directly with the implication of using the computer as a tool, and as a teaching medium in the process of design.

INTRODUCTION

A distinct part of the new curriculum in the Department of Architecture at Carnegie-Mellon University are the required courses that all freshmen and sophomores must complete. One such course is entitled "Computer Modelling in Architectural Design". This course is designed to acclimate the student to the use of computer graphics in his/her design process. The current facility for the use of such computer equipment is located in the College of Fine Arts building which houses all of the upper level design studios. Yet in the near future, Carnegie-Mellon is going to equip each incoming student in the university with a personal computer which implies further application of the computer in students architectural curriculum. For the computer to become an integral part of the design process, questions of its role in the architectural studio and adjacent courses, along with its latent influence in modifying the design process need to be addressed as current academic issues.

REFERENCES

All faculty and students of the Institute of Building Sciences, and Department of Architecture Carnegie-Mellon University and all resources therein.
PURPOSE

Please refer to the EDRA Workshop entitled "Passive Solar Design of Essex-Dorsey Senior Center, a Question of Balances: Case Study, Part I." As a natural extension of this session, a convenient time to look at accompanying visual material is provided in order to show and discuss the DOE demonstration project in greater depth.

FORMAT AND EXPECTED OUTCOME

Examples of the various types of visual material available are: a) An architectural model of the project, b) Copies of DOE's case study, c) Six large posters outlining the concept and its development, d) black and white photos, and e) Architectural drawings. The session provides the opportunity for those interested in details -- technical, aesthetic, behavioral -- of the design, to have informal discussions with those directly involved in the design process. Questions raised during the workshop can be explored at greater length, particularly the issues of balances and the value of an interdisciplinary approach, using specific examples.
A CONTRIBUTION TO A CONCEPTUAL MODEL
FOR EVALUATING BUILT ENVIRONMENTS

Calvin R. Brown

Psychology Department
University of Saskatchewan
Saskatoon, Saskatchewan
Canada, S7N 0WO

POSTER SUMMARY

This poster illustrates an award-winning design for senior citizen high-rises and describes a research project for evaluating the environment-behavior interactions of the building users. The research demonstrates an application of the general conceptual model from Evaluating Built Environments (Marans and Spreckelmeyer, 1981). Photographs and floor plans of the buildings are supplemented with brief descriptions of the evaluation issues and relevant measures. The present application of the general conceptual model is an attempt to examine some of the relationships which were proposed by the original authors, but untested in their study. Participants are invited to discuss the particular design of this post-occupancy evaluation and the general utility of a generic conceptual model for evaluating built environments.

References

This session will present children's images of alternative neighborhood futures as they developed in the context of an action research project funded by the National Endowment for the Arts which is currently ongoing in New York City. The project team has been working with fifth and sixth grade children in three neighborhoods undergoing environmental change, including abandonment and gentrification. The children have used a variety of media (drawing, model-building, collage, photography and photocollage, mapping, audiotaping, slide-making and others) in the process of creating, transforming, and attempting to realize their images of alternative futures. They also actively seek out and learn to critically examine the ideas and images of others: children in their school and people in the community (neighbors, family members, workers, older people, and representatives of local groups and city agencies, for example) as well as those of teachers and other school staff. Their research discloses the kinds of decision-making processes which produce changes in the urban environment, and allows them to identify and focus on specific neighborhood problems. Children thus become active and informed participants in the formulation, evaluation, communication and ultimately implementation of plans and proposals for neighborhood change.
PROBLEMS OF URBAN DESIGN IN INDIAN URBAN DEVELOPMENT

Richard Seaton

School of Architecture, University of British Columbia

POSTER SUMMARY

Population growth in India is greatest in the big cities and least in the smaller. Partly as a result, the former have in the past received the bulk of development assistance. The (current) Indian Sixth Five Year Plan tries to rectify this imbalance through long term low interest loans to smaller towns (size 50 K to 500 K) to upgrade infrastructures. In part, the Plan aims at making these cities more attractive to migrants, thereby buffering population pressure on the big cities.

Unfortunately, state development of small and medium towns and cities in India does not call for urban design. As a result, the installation of services, corridors and trunks likely will occur in lineal fashion outward from the core, without careful regard to the enclaves and territories of extended kin, subcaste or religious groups. Few outdoor amenities are likely. Peripheral villages will be left unprotected against inundation by speculative buy-up. Squatters will take over empty spaces between "projects". Densities will not suffice to encourage concentrations of diverse small shops; transport costs will be high in time as well as money.

INTRODUCTION

"As the quality of life in the smaller towns declines, they become less capable of exerting a counter-pull to the metropolis and thus mitigating the problem of metropolitan congestion" (Ghandi, 1975).

MAIN THEME

The development of Indian towns and smaller cities is characterized at their margins by chaotic scattering of projects over former agricultural lands, with squatters in steep, swampy, flood-prone or waterless interstices. Development is often marked by shortages of play space, lack of shade, dusty lots, unmetalled roads, ad hoc parking, and distant shops and services. Long bus commutes to work and shopping are normal. Residential densities are low, and neighbouring villages are engulfed.

The latest census estimate of the Indian population now stands at 680 million people, up about 100% from the start of independence 30 years ago. Big city growth has been much greater, doubling every decade, while small towns grow at 10% decennially and medium cities at only 30%. They have been bypassed by both people and resources. Now their development is proposed for funding, to attract migrants and enterprise. Without consideration of urban design ramifications, however, development "counter-pulls" may founder through social dislocations, negative environmental impacts, mislocations, disruption of circulations, and the like.

FORMAT

Both the assets and liabilities of small and medium cities as targets for development are described and illustrated as foci for discussion. Some examples of urban development in larger cities are shown to illustrate urban design ramifications unlikely if smaller cities are developed. An experimental design for testing the effectiveness of urban design input to development is advanced for consideration and comment.

EXPECTED OUTCOME

This session undertakes to advance environmental design research at an urban design scale in Third World or "Southern" milieux. If it is successful, it will provoke response and criticism from other investigators; it may also stimulate them to try like endeavors.
The editors of this EDRA 1983 Proceedings have spent an enormous amount of time with the refereed papers and symposia presented in this volume. We have read, digested, and contemplated these works, casually at first before they were sent to the referees and intensively after they were returned. We became intimately acquainted with them and gradually came to view them not only for what they specifically had to say but also for their broader implications.

We have thought about ways to organize these refereed papers and symposia and, in the process of actually doing so, have formulated a set of guiding questions somewhat like the following: What sort of conceptual relevancies do the issues in these papers and symposia have for current major paradigms on person-behavior-environment relations? Do these works offer any new theoretical formulations, insights on methodological procedures, or significant arguments about the effects of designs on person-environment transactions? What major issues and/or questions are being raised? In each of these works, we inquired about what was being said, observed, constructed, speculated on, and, if applicable, tested. We, in effect, attempted to sort out the information that was being generated by each contribution.

What follows from this exercise, then, is our organization of these works, summary descriptions of what was intended in each of them, and occasional editorial comments about the broader aspects implied in many of these works.

1. PAPERS
1.1 BUILDING THEORY

A. FUNDAMENTAL CONCEPTS: SYMBOLIC REPRESENTATIONS OF THEIR MEANING AND SCOPE AND BOTH AS INFLUENCES IN DISCOURSES ABOUT THEM.

For the questions we ask and the research we do, all three concepts, environment, behavior, and design, are undoubtedly fundamental. What we mean by each of these concepts and their appropriate extensions to events are as theoretically important questions as those involved in the theories we build utilizing them. There is certainly much evidence that, for at least the concept of environment, scope and meaning are still at issue. Nec Teymur's paper on "What is a Symbol: Graphical Representations in Environmental Discourse" addresses this issue. It is a critical examination of the many uses of the term environment (with or without "man") by academics, professionals, administrators and others during the last two decades. Teymur indicates that the concept environment has come to mean everything in general but practically nothing in particular. He illustrates how the many meanings of the concept are reflected in the prevailing ongoing discourses about "man and the environment" and shows how the graphics used in these discourses, in the sense of their symbolic and image portrayal, condition understanding and perceptions of issues inherent in the domain of person/environment relations. When a fundamental concept, such as this one, is fuzzy in meaning and susceptible to nondisciplined usage, conceptual instability is translated throughout the structures built upon it.

B. SHIFTING SIGNIFICANCE FROM ONE CONCEPT TO ANOTHER IN BASIC AXIOM SETS: MANNING TO RESPONSIBILITY

What is significant about a theoretical perspective is the potential number of relevant implications it is capable of generating. A perspective that implies little typically covers a narrow domain of events and, consequently, produces few hypotheses and associated problems. Often, the implications of a theory can be widened considerably by shifting the ideational significance of a fundamental concept from a secondary position to a primary one and restating basic axioms so as to encompass that shift. In his paper, "Responsibility Theory," Robert Bechtel attempts some of this sort of shifting. Manning theory (particularly, underman-ning), as it is related to the ecological perspective on environment and behavior, is his central concern. Manning has its meaning significance with regard to behavior settings, in the sense that it refers to the filling of necessary positions in a setting. The theory isolates for examination three conceptually
meaningful conditions of manning: under, over, and optimal. Looking at a behavior setting from its two basics, its program and maintenance, undermanning refers to the lack of enough individuals to carry out, without difficulty, the tasks essential to these two basics. Undermanning can be viewed, depending on its degree, as a potential threat to the continued existence of the setting itself. In undermanned settings, individuals participate, largely by necessity, in a greater number and variety of activities associated with the program and maintenance of the setting than is the case in optimally manned types. And since activity specialization is less and participating involvement with a wide variety of activities is greater in the undermanned when compared to the optimally manned, individuals in such settings take on more responsibility, attach greater importance to the forces operating in the setting, have a greater sense of self identity, feel more needed and more important, and so on. These consequences of undermanning are often referred to as the positive benefits resulting from undermanning. In an undermanned setting the critical variable appears to be the number of individuals available to carry out the activities associated with the program and maintenance of the setting. When there are not enough individuals to carry out such tasks, a setting becomes undermanned, and the whole scenario of activity-participation with respect to number and variety of tasks per individual changes, presumably by necessity (i.e., smaller numbers to carry out the same or given number of tasks). From this undermanned situation, as the theory goes, positive benefits, as just described, should follow. Bechtel, however, points out in his work that researchers have found settings that were undermanned and, yet, no positive benefits accrued to the occupants of the settings. Residual findings from manning theory have apparently also been found with respect to overmanning; that is, positive benefits of the sort described above accrued to the occupants of these settings also. Bechtel indicates that what accounts for these deviations from the theory is the existence of responsibility and whether or not it is shared. Thus, population size of a setting may be a necessary condition to produce these benefits in the undermanned setting, but it appears not to be sufficient; Bechtel believes that responsibility is the sufficient condition. Hence, his suggestion in his paper that the manning theory be changed to "responsibility" theory.

C. INCORPORATING MONITORING CAPABILITIES, TOLERANCE THRESHOLDS, AND OVERRIDING MECHANISMS IN FEEDBACK TYPE PERSON-BEHAVIOR-ENVIRONMENT MODELS.

Have the social and behavioral theory contributions to the design disciplines' central problem of improving the fit between individuals and environments been adequate, useful, fruitful, etc.? From experience, the answer to this inquiry would have to be "yes and no," "to some degree," or "in some instances," and so on. Competing theories offered by these sciences have often come up short with respect to the accuracy of their implications for the individual events encompassed in the realities of person-behavior-environment experiences. And yet, despite that shortcoming, there appears to be a macro conceptual attractiveness or holistic plausibility in each of these theories. In his paper, "Dynamic Reciprocal Determinism: A Synthetic Model of Person-Behavior-Environment Relations, Danford indicates that such contributing theories, while not in each instance adequate to predict the actual events in an environmental experience, do have some elements of truth to them; and, throughout time, such elements typically get incorporated into models concerned with person-behavior-environment relationships.

Bandura's Reciprocal Determinism Model is a recent example (see American Psychology, 1978, Vol. 33, pp. 344-358) of how such truths become integrated into theoretical structures. The model contains the two mutually interdependent person-behavior and behavior-environment dependency sets embedded in the more fundamental person-environment reciprocal relationship.

In his paper, Danford extends Bandura's model by adding "elements of truth" that take into consideration the dynamics of reciprocal responses in potential feedback situations in which the demand character of the environment threatens to significantly alter behavior-environment relations. In particular, utilizing Bandura's model as a basic framework, Danford adds a cognitive monitoring process and an overriding behavioral response to the fundamental person-behavior-environment equation. He frames all of this into an equilibrium process which, when not in balance, triggers overriding behavior. That is to say, in his proposed revised model, the incompatibility between environmental demands and environmental mastery, vis-a-vis a person's tolerance threshold of behavior-environment relations inconsistent with
"values, expectations, capabilities, etc." activates an overriding behavioral response to change the existing behavior environment relationship.

D. MEANING IN THE BUILT FORM

The concern with the importance of meaning in concept definition is a general one and is therefore experienced by all engaged in research. But when meaning is itself a principal ingredient in some specific domain of investigation, then the concern becomes relatively particular and somewhat critical. The participants in EDRA find this latter sense of meaning especially significant because their basic inquiry about the ways in which people respond to environments and the reasons for these responses cannot be completely resolved without dealing with how people attribute meaning to the environment.

Meaning in or of the environment, built or otherwise, is certainly not a new concern for those intensely curious about person-behavior-environment relations. Questions on how meaning is transmitted, who transmits it, through what media, and how and what is apprehended, among others have been entertained in the past through a variety of different approaches. Some have studied meaning by investigating how things function as signs and how signs carry meaning, treating the concept of sign somewhat like a cue. Others have placed greater emphasis on the symbolic base to meaning, describing how symbols function effectively as forms of communication because their underlying implied messages about expected behavior, uses, purposes, etc., are usually commonly understood by members of a given social system. Additional investigations on meaning were generated by the basic propositions evolving out of the C.E. Osgood's (and others) attempt to measure meaning and G.A. Kelly's theorizing about personal constructs. Such propositions appeared to have provided effective bases for operationalizing the notion of meaning in and of environments, utilizing semantic differentials, repertory grids, and factor analyses.

A substantial literature on meaning in the environment, then, has been generated in approximately the last three decades; yet, many of the basic questions seemed to have gone unresolved and appear to be still with us. In the category of the built environment these include: How does meaning become a part of the built form? Who determines meaning; does the architect build in or does the user assign? Is it accomplished by both utilizing a commonly understood meaning system? Just how does built form or its elements achieve a transmission of intended meaning to users? How is a consistency achieved between meaning built in and meaning assigned? Which meaning are we to be concerned with: that of the architect or the meanings the built form has for the variety of its many different users? (See how such questions are being raised once again in the contemporary works: Meaning and Behavior In The Built Environment, edited by G. Broadbent, R. Bunt and T. Llorens and published by John Wiley and Sons in 1980; and The Meaning of the Built Environment: A Nonverbal Communication Approach, by Amos Rapoport and published by Sage Publications in 1982.)

Unsettled questions of this sort undoubtedly provided some of impetus for Linda Groat's paper on "The Past and Future of Research on Meaning in Architecture: A Typology For Describing Existing Research and The Case For Architectural Theory As a Basis For Future Research." In this paper, the concern is with meaning in architecture as viewed from two perspectives: that of design research and that of design practice. Groat claims that, though both of these areas have a fundamental interest in all the different categories of cognitive responses (e.g., perceptual, intellectual, and emotional) that "are generated by exposure to built form," there is little interdisciplinary exchange between them. This seems to be due mostly to the fact that the two areas appear to consistently emphasize different and separate aspects of meaning in architecture; for example, design research is said to emphasize meaning of a setting while the emphasis of design practice is on the physical attributes themselves. The difficulty here seems to be on how to link the two emphases conceptually. Groat argues, through a presentation of a typology, that the literature on architectural theory (actually, architectural principles, discourses, conceptualizations, etc.) provides a wealth of material for designer researchers to construct hypotheses which would enable them to relate physical attributes to meaning; and, hence, a linking would then be established between the two areas.

Much of Groat's concern can probably be rephrased this way: can the physical attributes of buildings be used in some systematic ways so as to communicate certain meanings to users of built forms and thereby, through some causal chain,
elicit responses which are compatible with an architect's intentions regarding use? It appears that an answer to a question of this sort must be found in the functional dimension of meaning interpretation. But if this is so, what about the affective and/or evaluative dimensions of meaning? How can schemes of physical form guarantee that affective meaning to the user will coincide with the affective intentions of the architect? Is this a minor question of the whole meaning interpretation issue? Apparently not in Rapoport's view. In his new work cited above, he says this:

"It appears that people react to environments in terms of the meaning the environments have for them. One might say that 'environmental evaluation, then, is more a matter of overall affective response than of a detailed analysis of specific aspects; it is more a matter of latent than of manifest function, and it is largely affected by images and ideals.'" (p. 13).

E. EXPANDING THE CONCEPTUAL BASIS AND FUNCTIONAL STATUS OF DESIGN

There are two papers that, from different perspectives, are concerned with this same issue. The first one, by Josuck Koh, is on "Design For Fantasy and Fantasy for Design." Koh's paper is an attempt to formulate some ideas about an alternative design approach which incorporates fantasy into the design process and suggests designing for fantasy. Whether fantasy should ever be a significant issue in design remains to be decided. Perhaps, among other things, its inclusion as an issue should be influenced by the existence of a need. It certainly is quite interesting to note, as the author does here, that "fantasy encompasses a very large share of our wakened awareness, whereas directed thought and concentrated scrutiny occupy only a limited amount of time in our life." Koh does make a very persuasive argument for its inclusion. He examines the meanings and implications of fantasy, dreams, the unconscious, psyche, image, symbol, creativity, and design and integrates them into a plausible scenario. His suggested approach rests partly on the observation that fantasy, dream, and design are all creative processes and that all three deal with images as raw materials. A sense of Koh's conceptualizing is well captured with this excerpt from his paper:

"Design for fantasy is designing for the totality of self, rather than for the conscious ego which is still fragile, a limited and limiting partial self at a very early stage in its evolution. To design for the totality of self, we have to make our environment communicate not only with the conscious, cultural man, but with the unconscious, natural man. In other words, we must design not only with cultural symbols for function, structure, and economy, all of which are the concerns of the conscious world, but with 'natural symbols' from the fantasy and dream of the more stable and conservative unconscious."

Jon Lang, in his paper "Perception Theory, Formal Aesthetics and The Basic Design Course, is also concerned with the conceptual basis of design, especially as it is currently and commonly represented in the fundamental design course.

According to Lang, persistent and wide criticism is leveled at the basic design course today because, as it is taught, it rigidly structures thinking, inhibits creativity in problem solving and misinforms about (hence, possibly misrepresents) the nature of formal aesthetics. He implies that the major problem with the course genre is the influence its outdated theoretical foundations are having on the issues in formal aesthetics particularly those dealing with perceptions of pleasure and beauty in forms, configurations, patterns, and generic organizations associated with designs.

Lang indicates that compositional principles, as taught in most versions of contemporary basic design courses, have their roots in the conceptualizations of form and expression put forth by the gestalt theory of perception. Consistent with such roots, the intellectual orientation of the basic design course appears to be influenced by two fundamental assumptions: (1) that there are elements of form and laws to organize these elements, and (2) the belief that "visual coherence is more related to our neural and psycho-physiological being than to our processes of intellec tion." Thus, given basic and constructed elements, unified design schemes are supposed to be obtainable by applying the "gestalt laws of visual organization." In effect, the orientation and material of contemporary basic design courses appear to be tied to a single facet of perception theory:
The classical gestalt position. Lang asserts that the basic design course can improve its theoretical underpinnings and, therefore, its information base for teaching formal aesthetics by actively considering developments in perception theory, particularly with regard to the transactional and ecological positions, and by incorporating findings from research in empirical aesthetics. He discusses several, commonly accepted, generalizations that have evolved out of research on environmental knowing and experiencing which still appear to be ignored by the basic design course, as it is currently taught. Lang makes it clear that there are significant cognitive and social-cultural components to environmental perception and suggests that the basic design course, in its needed reformulation, should expand its largely physical, visual treatments of perception by conceptually integrating the implications of these components into its foundations.

1.2 METHODOLOGICAL ISSUES AND THEORETICAL PERSPECTIVES

A. THE CHOICE OF A RESEARCH DESIGN AND ITS RATIONALE

Which research designs are best suited or are most appropriate for generating information about person-behavior-environment relations? This is not a question concerned with the selection of a data collection procedure. Rather, it is more an inquiry about the choice of a structured investigating process. One that, if employed, will presumably facilitate the uncovering of measurable observations about the nature and particularly the consequences of actions, reactions, interactions, and transactions taking place in some delimited problem domain. Convincing arguments can be made that the selection of research designs are guided not only by their potential to uncover such things but also by the nature of the phenomena that are studied, the questions that are asked about them, and by the current order-specifying paradigms (theories) in use. Since the third one frequently reflects the user's model of the world, it is probably the most significant.

In this regard, consider two major paradigms currently in use in the study of person-environment relations. One is organized around behavior settings and manning considerations while the other stresses transactions in and with context. In both these theoretical perspectives, whether viewed in an ecological sense as in the former or as a feedback, systematic process for the latter, the attempts toward explanations of the phenomena of interest (e.g., activities, experiences, evaluations, etc.) are highly dependent on the physical environments or settings within which the phenomena take place. This is, in fact, what both paradigms state: settings are part of the explanations because of their alleged decisive interconnections with the phenomena of interest. Furthermore, since such settings themselves vary, they enjoy the somewhat singular distinction of potentially entering the explanation attempt as either a parameter, a variable, or both.

Supporters of different theoretical perspectives and sometimes even the same perspective have, on occasion, argued for a particular research design. Some, for example, indicate that, because the context or the environment is such an integral part of the phenomena being studied, the selected design should facilitate a gestalt type of explanation whereby systematic description is emphasized - like in a case study approach. Others indicate that the most efficient research designs are ones that facilitate causal explanation attempts in a hypothesis testing sense - as is exemplified in the formats of experimental and quasi-experimental designs. Much is understood about the latter designs; but what about the case study? Though this appears to be a logical design to use, particularly in ecologically-oriented explanation attempts of person-behavior-environment relations, the case study approach suffers from a poor reputation with respect to its weak potential to control for extraneous effects, establish internal validity, permit the manipulation of independent variables, and facilitate the construction of causal explanations. But in what sense are such handicaps important in the study of person-behavior-environment relations, given the different theoretical perspectives on such relations and the significance of the context or the environment in the explanation of them?

These are the issues and questions of concern in Gary Winkel's paper, "The Challenge of the Case Study for the Environmental Design Researcher." In his attempt to deal with them, Winkel discusses the merits and weaknesses of case study approaches to investigating environmental design research problems, particularly when compared to
experimental and quasi-experimental designs. He views the advocates of these two major research designs as being oriented toward the descriptive (as frequently exemplified in holistic outlooks) or hypothesis testing tradition respectively. With the outlook of those traditions as focal points, Winkel suggests ways to treat the Case Study design so that the results from its research will take on some of the qualities of the results emanating from an experimental design -- e.g., replicability, reliability, and causal argument supporting.

B. MEASURING LOCATIONS ERRORS IN EXTERNAL RENDITIONS OF SURROUNDINGS

Methodological issues also mesh with conceptual issues in the area of cognitive mapping, particularly with regard to cognitive maps per se. In this instance, however, the entanglements are somewhat different, perhaps more critical, than that just described. Conceptual issues associated with the study of cognitive maps seem almost to confound methodological resolution, rather than aid it. This is probably due to the existence of severe ignorance about the mapping rule or rules employed by individuals to go from internal configurations (cognitive maps) to external renditions (e.g., two-dimensional sketches). Presumably, there should be as many rules as there are distinct cognitive styles; but even this number may be further reduced by the constraining influence of meaning or symbolic systems. Whatever their number and nature, this lack of understanding about such rules translates to methodological considerations in many different ways. One such translation that has immediate relevance occurs when attempts are made to measure specific properties of cognitive maps. In research, methodological issues are typically resolved for external renditions of cognitive maps; but, since isomorphisms and other relevant congruencies existing between internal and external representations are never really known, what exactly has been resolved frequently remains open to question.

This is the methodological-conceptual entanglement that confronts Nathan Gale in his paper, "Measuring Cognitive Maps: Methodological Considerations From a Cartographic Perspective." Gale's purpose is to define and operationalize location-error types in external renditions of surroundings. He suggests the use of a cartographic perspective in the measurement, analysis, and portrayal of both the distortion (accuracy) and fuzziness (precision) that may be contained in subjective renditions of sets of locations in a given place. Gale proposes that the direction and degree of distortion between the actual location of a point of interest in an area (landscape, environment, setting, etc.) and the mean center of the total sample estimates of that location be measured and portrayed by a displacement vector, the length and direction of which have meaning with respect to this type of error. Fuzziness, on the other hand, is to be treated as essentially an areal variance of the location estimates made by the sample's subjects in their renditions of their cognitive maps. Gale recommends that this be represented on a map by a "standard deviational ellipse." The area of such an ellipse and the inclination of its major axis would constitute two reflectors of fuzziness.

Gale attempts to show how such measures and their portrayal help to bring out information about relationships that may exist between subjective renditions of certain locations and particular prominent features in the area for which such renditions were elicited and also information about a sample's overall familiarity with a given area. Like Winkel, Gale also illustrates how a discussion of methodological issues in this area inevitably entails conceptual and theoretical discussions as well.

1.3 EMPirical INVESTIGATIONS

The papers in this category primarily focus on specific groups, selected environments, and definite ways of transacting with surroundings. They are mainly concerned with comprehending and explaining observed subsets of facts, events, instances, or, in general, observations. It is on such terms that these papers are distinguished from those in the other two categories above. But a distinction of this sort should not be exaggerated; nearly all of these authors state, rationalize, and test hypotheses and, by doing so, maintain some degree of conceptual contiguity with the issues defining the categories above. Their papers definitely relate to theoretical and methodological considerations, not only through the results emanating from hypothesis testing but also through the expositions contained in the rationalizations of such hypotheses.

A. ENVIRONMENTS AND THE OLDER PERSON

Two authors in this empirical group deal
with problems associated with person-environment relations for the older individual. Mary Kalymun, in her paper on "Factors Influencing Elderly Womens' Decisions In Their Choice of Living Room Items During Relocation," examines how elderly women alter their new surroundings with items gathered from idiosyncratic selections of possessions from past living environments. With the use of content analysis Kalymun attempts to classify or group the factors responsible for their decisions to "eliminate, retain, and acquire" furniture, accessories, decorative, and other items into two domains -- environmental and personal.

It is of course, not just the elderly that relocate and, in the process, face decisions about which possessions will be taken from the old environment and placed in the new; relocations because of new job opportunities, job transfers, leaving for school, and so on are other varieties that involve different people and different groups. Perhaps, possession-transfer decision-making is a behavior that involves a modification or a redesign of the new environment's fundamental structure so that it is suitable for some preferred spatial and temporal pattern of behavior. Perhaps, it reflects attempts to transfer some old environmental ambiances to new environments. Maybe the behavior is a manifestation of a need to maintain the continuity of self that is place specific. It could, of course, be economically motivated. It is possible that possession-transfer behavior in all relocations is motivated by all of these at once, each varying only in importance or strength. From a theoretical and broader perspective, Kalymun's research on this issue suggests the possibility that one of the ways that one copes, adjusts, or adapts to new spatial and environmental conditions is through the process of selectively transferring some of the personal markers (items, things, objects, etc.) of the old environment to the new surroundings.

Mary Ann Parris Stephens and Jennifer M. Kinney, in "Congregate vs. Traditional Housing for Older People: Differential Patterns of Behavior Among Residents," deal with a different aspect of older persons relations with environments. They are mainly interested in the influences of designed environmental demands on behavior. They examine housing types for "relatively healthy and self-reliant" older people with respect to the issue of designing appropriate environmental demands within them. What sort and degree of environmental demands should be built into such housing structures: those that facilitate the maintenance and expression of independence or those that go more toward meeting the daily and basic needs of the residents? Is a compromise between the two better than a major emphasis on either one?

Questions concerning the creation of different types and degrees of environmental demands that enable a variety of goals or objectives to be accomplished by the clients utilizing or inhabiting the designed structures are not idle inquiries; and this is particularly true for the group examined in this study. A prevailing belief appears to be that prolonged independent functioning is vital to the continued physical, emotional, and mental health of the individual. Environments that demand active behavior are said to encourage or facilitate independent functioning. For this client group, however, the issue of designing degrees of environmental demands into housing structures is not independent of the provision of on site services. Thus, it is asserted that, in a given housing environment for the healthy self-reliant older person, the "presence of too easily accessed services might erode independence among individuals who are still competent." But an alternative view maintains that older people experience difficulty in carrying out daily activities necessary to meet their basic needs. The suggestion consistent with this view is that housing for the elderly should incorporate designs that provide for and facilitate easy access to on site services. With respect to examining these issues and their implications on person-environment relations further, Stephens and Kinney observe and compare the daily behaviors of residents in two types of housing facilities for older people: Congregate and Traditional. These housing types apparently differ from one another on the basis of the environmental demands they place on their residents with immediate regard to the provisions and facilitation of on site activities and with ultimate regard to the differential influences they may have on residents behavioral patterns in general. The Congregate type is such that meal, housekeeping, and nursing services are provided and made accessible in specific places, while the opposite is the case in the traditional design; residents in the latter are responsible for providing these basic services themselves in their individual units. In this study, Stephens and Kinney specifically inquire about differences in the daily behaviors of
older people within each of the housing types and, especially, between the two types. Because of the differences in the designed environmental demands in each of the housing types and their asserted potential to suggest, enable, facilitate, etc., a greater frequency of certain kinds of behavior relative to others, Stephens and Kinney focus on behaviors associated with individual physical activities and social participation.

B. PERCEPTION AND EVALUATION OF ENVIRONMENTS

A second general theme occurring in a number of these empirical works is that of perception and evaluation of environments. The papers characterized as falling in this group, however, have so much to say about so many different concerns in person-environment relations that it seems almost artificial to group them under this theme. Dorothy Butterfield's research on "Neighbors' Perceptions of Outdoor Spaces Surrounding Group Homes for the Developmentally Disabled Adult" is an excellent example of a work with such wide implications. In her paper, she confronts the issue of designing a structure with its immediate surrounds that simultaneously meets relatively distinct needs, fits into an established social-physical setting, and encourages certain types of mutually reinforcing behavior between the clients of the structure and the residents of the given setting. Design tasks of this sort occur particularly when attempts are made to place and build group homes (as opposed to institutions) for the developmentally disabled adult in established neighborhood settings. The specific problem of Butterfield's research is to examine the differences in neighbor perceptions of the immediate outdoor areas surrounding the group homes for the developmentally disabled adult and to account for those differences. Neighbors' perceptions of the group homes, their residents, and the total environment of the group home are of particular importance in decisions on where to locate such homes. Neighbors appear to have a variety of fears, not only about property values but also about various imagined consequences of personal contact with the residents of such homes. From a design perspective, the primary issue seems to be one of constructing an environment (group home and immediate surroundings) that is consistent with neighborhood norms, on the one hand, and permissible and supporting in meeting the self and social needs of the home residents on the other. Butterfield utilizes neighbors' levels of satisfaction with group homes as her criterion variable (i.e., an operational reflector of neighbors' perceptions) and develops, via factor scores, two independent variables to account for the variance in the levels of satisfaction. She labels the two independent variables as "contact between neighbors and group home residents" and "Safety in [ones] yard." Her findings lead her to suggest design recommendations that encourage close proximity of group homes and their surroundings to neighbors and facilitate the creation of outside spaces that are supportive of social exchange.

Paul Gobster, in his research on "Judged Appropriateness of Residential Structures in Natural and Developed Shoreland Settings," also contributes to this general theme of perception and evaluation. In this work, Gobster evaluates the variance in subjects' judgements about the visual appropriateness of residential structures in natural and developed shorelands. He defines visual appropriateness as the "compatibility of development relative to its perceived setting" and a setting as "the implied context in which a land use is viewed." Four different types of settings are relevant for his project: "wild", "natural", "recreational", and "urban". Gobster presented subjects with slides of shoreland development and asked them to judge or rate, for each of these four setting types as contexts, the degree of visual appropriateness of the given development. He hypothesizes that the perceived changes in the setting would influence evaluations of appropriateness. His results indicate that setting types, factors such as naturalness, complexity, and contrast, and interactions of these are significant sources of variance in accounting for subject's responses about the degree of appropriateness of development along shoreland. Gobster recognizes that appropriate uses of shoreland settings is an extremely significant policy issue for many areas (e.g., East, West, Gulf, and Lake states). In a general sense and as a rationale for his own work, he deals with the issue of bridging the conceptual gap between environmental research and public policy about environmental use. He asserts that the major problem in establishing a working link between these two areas is, on the one hand, that the concepts developed in the environment-behavior research area often seem inapplicable when pitted against the relatively practical or concrete sort of problems faced by policy makers; and, on
The other hand, the decisions made by public policy makers frequently appear to be groundless when compared to the results obtained from empirical studies on landscape perception and preference. Coblentz feels that the key to establishing working links between these two areas is to translate research concepts into a "language" suitable for direct use by policy makers, as they go about allocating, managing, and establishing standards about environmental resource use. This is what he hoped to accomplish with his own work on shoreland settings.

The final empirical contribution to this perception-valuation theme is by James Hassinger. In his research on "Attributes of Urban Environments Feared by Handgun Carriers," Hassinger examines those environments in an urban county that are perceived to be unsafe. The sample he uses in his study is a comparatively unique one, in the sense that it contains those individuals that are apparently prepared to employ a particular and relatively extreme behavioral response to dangers believed to exist in unsafe areas. That is to say, all subjects are handgun carriers, and 94% (sample size = 278) of the sample report needing the gun for protection when leaving their home neighborhood. The intended behavioral response to unsafe areas certainly does not appear to be clearly in the avoidance set for this group. But this has little to do with the main point of the study; Hassinger is primarily interested in the particular attributes that, according to their perceptions and beliefs, make subjects think that different environments are unsafe. Of the 101 distinct county places perceived as unsafe, "juveniles loitering," 'race' differences, 'not enough police or guards,' 'news reports of specific crimes', and 'common knowledge that the area is bad' were those attributes most frequently mentioned as causing subjects to think that different locations were unsafe. It should be noted that these are not physical attributes of the perceived unsafe areas but, rather, are reflectors of social conditions. Thus, an especially significant question that is generated by the results of Hassinger's study can probably be phrased as follows: what physical aspects and designs help to trigger, evoke, or cue perceptions of unsafe conditions in the environment?

C. BUILT ENVIRONMENTS: TRANSACTIONS WITH AND SATISFACTION

The last of the empirical investigations appear to relate closer to this theme than to others, even though the authors of these deal with far more topics than they originally proposed to. The paper by Glenn Ferguson, for example, looks at user satisfaction with a particular type of built environment. In his paper, "Employee Satisfaction with the Office Environment: Evaluation of a Causal Model," he specifically examines the relationship between office openness and user satisfaction with that office. To evaluate this relationship, he constructs a causal model (i.e., one that allows for mediating influences and feedback effects) which depicts organizational variables influencing such things as decisions about the use of physical space, employees perceptions of the office environment, and user responses to such surroundings. Perceptions are also said to be influenced by the physical setting of the office itself. In an operational sense, Ferguson's causal model contains his principal asserted relationship between an office's degree of openness and satisfaction with office, mediated by "distraction due to noise" and "perceived privacy." His organizational variable is operationalized by the surrogate job level which is hypothesized to have an effect on the actual degree of openness, distraction due to noise, and, additionally, is supposed to influence perceived privacy and satisfaction with office. Utilizing eight different office environments and 288 participants, Ferguson makes use of path analysis to assess the strength of the hypothesized links in his causal model.

Andrew Seidel provides the other contribution to this theme. Transactions with a highly functional, relatively complex built environment to achieve specific goals is the general issue in his research. In his "Way-Finding in Public Spaces: The Dallas/Fort Worth, U.S.A. Airport," Seidel specifically investigates the spatial and environmental behavior of way-finding as it takes place in this airport. His chief interest is to assess the nature and degree of way-finding difficulties experienced by airline passengers after deplaning, as they moved through two different routes (gates) in their attempts to locate the baggage claim area. In his assessment of the difficulties experienced, he examines three significant transactional aspects of this behavior: places at which cues were utilized, locations at which directions were asked for, and specific points along the routes that especially provoked confusion. Since the movement-facilitating design of one route (gate) differed from the other, the expectation (i.e., the literature would
suggest) was that the corresponding way-finding experiences of the passengers using them would differ. Seidel discusses this real-world example of way-finding in a public place in terms of what has been reported in the literature on this behavior, and, in the process, he provides an extensive review along with his research. Studies on topics of this sort usually have a great deal of ideational provocation because they touch so many theoretical bases (e.g., environmental cognition, and cognitive maps, spatial orientation, environmental stress, among others) and have significant implications for planning and design of places at a wide range of scales.

2. SYMPOSIUMS

2.1 THE AESTHETIC DIMENSION

The notion of the aesthetic appears at times to be disturbingly fuzzy. This is not because this quality is not real, but because its meaning is frequently battered around by distinct and sometimes antagonistic philosophical positions which, in their attempt to define it, seem to laden it with equally as fuzzy concepts. But this may be a function of its very nature. In use, it is commonly subjectively grounded and often reflects tastes and values. It is strongly perceptual in nature and appears to be "more at home" in the experiential, phenomenological perspective than in the scientific. If it is assumed that the aesthetic constitutes or reflects a possible dimension of the equally fluid concept, "environment," then it is certainly no wonder that severe operationalizing problems are experienced in research on environmental transactions in general or responses in particular. Thus, it is evident that considerably more needs to be known about what is meant by the aesthetics of environments, the meaning of the quality itself, its epistemological bases, how and in what ways the quality is experienced, its influences on environmental transactions, its cultural or social links, how to deal with it in research, and so on. Two symposia, "Environmental Aesthetics: Applications In Decision Making For Multiple Users" and "Environmental Aesthetics: Empirical Research," both organized by Jack Nasar, attempt to deal with some of these issues. While both symposia treat environmental aesthetics mainly in terms of the visual quality of surroundings, they differ in their particular emphases.

Public policy or, more specifically, decision making at the public level regarding environmental regulation, use allocation, and evaluation is the focal point of the first symposium. Its general interest is with increasing the awareness of public policy makers about aesthetic concerns in the environment. The ways to deal with such concerns are discussed in the different contributions to this symposium, particularly in the paper suggesting a "multiattribute, multiobjective, decision making approach for aesthetic evaluation and in the one dealing with the information that should be acquired in order to draft "meaningful regulations for the visual quality of environments." There are also a series of case-study examinations in the first symposium. One deals with an attempt to have a state department of natural resources incorporate scenic value in its environmental regulation activities, while another paper discusses the visual decay of declining rural towns and offers suggestions on how to deal with such decay from a planning perspective.

The second symposium on environmental aesthetics emphasizes empirical research on environmental evaluation and preferences. One paper in this session illustrates how a multiple regression model can be utilized to predict users' perceptions of the scenic beauty of a river landscape. In this case, physical elements of the landscape and compositional indices (contrast, diversity, enclosure, intrusion, mystery, and uniqueness) are used as predictors. Employing the same type of model, another paper investigates the "factors influencing the visual compatibility of shoreline development." In this second case, ambient type variables, such as naturalness, contrast, and complexity, are said to have accounted for more of the variance in subjects' beliefs about appropriateness of development in different settings than did specific scene variables like vegetative screening of structures and setbacks. A particularly thought-provoking contribution offered in this symposium is the one dealing with a multi-dimensional scaling analysis of aesthetic preferences. Instead of eliciting subjects' aesthetic preferences of landscapes along given scales or descriptors and assessing the resulting psychological dimensions influencing those preferences, this work employs a multidimensional procedure to uncover the psychological structure used by subjects to form their aesthetic preference responses.

2.2 ALTERNATIVE KNOWING PROCESSES

This Symposium, organized by Joseph Juhasz
and titled "Fantasy, Imagery and Form in Design: Experiencing Process," examines the same fundamental theme as J. Koh's paper above: alternative ways of experiencing. The papers in it address alternative meaning or knowledge creation processes, particularly the type that are described as proprioceptive (loosely, self produced through interaction with an environment and supposedly independent of a given symbol set) and non-verbalizable. Though not usually designated as such, some information rooted in fantasy, perhaps dreams, and to some degree imagination can probably be said to fall more in this type than information that is symbolically or cognitively based. Information of this sort, generated specifically through environmental experiences, is more intuitive than cognitive, in the sense that there is little recourse to an established symbolic set. Juhasz indicates that knowledge creation processes of this sort, especially with respect to environmental knowing, are poorly understood; hence, the purpose of this symposium is to explore different facets of it. Contributions by the other participants include an existentialist perspective of individual and group experiences in built spaces, a discussion dealing with the importance of imagery in design and an argument for its increased use, and the learning of non-verbal forms (e.g., labyrinths and mazes) through use in design and design education.

2.3 MAINTAINING ENVIRONMENTAL MEANING

Linda Groat, in her symposium "Environmental Meaning: The Problem of Contextual Fit," looks at different facets of the same basic issue examined in Paul Gobster's paper. In particular, the concern of her symposium is with the variety of problems associated with what is called "Contextual Fit." Somewhat like Gobster's visual appropriateness, contextual fit refers to the perceived compatibility between an environmental or land use, as manifested by a new physical entity, and some given setting within which the use is to take place, or be inserted.

Groat thinks this concept should be of considerable utility to those who are involved with designing compatibly with many different established or existing settings -- e.g., architects, urban planners, interior designers, landscape architects, among others. Five presentations are offered in this symposium. Some are empirical and present actual research results, while others are theoretical. All deal with some sense of contextual fit along design scales ranging from interiors, architectural, urban, and to landscapes.

2.4 "AN ARCHITECTURE-WITH-PEOPLE-IN-MIND"

There are many significant aspects associated with learning to design for people, but two that seem particularly relevant are the teaching about environment and behavior research and the development of practical design skills. The symposium organized by Martin Symes, "Innovations In Design Education," presents, illustrates, and examines a variety of methods that propose to facilitate the integration of these two aspects within some format of design education. What is apparently being sought in this symposium is some type of design-and-behavior teaching format for architectural education and the methods suggested are oriented toward that goal. The symposium contributors, however, vary in their perspectives about the nature and importance of such a format in a professional architectural program. The proposed methods and associated rationales differ, but one ultimate goal seems to be shared by the contributors: The achievement of an architecture-with-people-in-mind. Five papers examine different methods for integrating the two aspects described above in this symposium. One deals with ways of translating behaviorally based research into design in the studio context. Another discusses the effects of introducing so-called subversive thinking into design projects. Still another explores the influence of the designer's personal, environmental values in their design efforts and the possibility of exploiting such values in design courses that ordinarily emphasize this objective. A fourth paper entertains the possibility of simulating reality in schools of design by exposing students to actual clients. And, finally, the fifth contributor investigates the feasibility of utilizing the case-study method in design education.

2.5 FORMS AND CONSTRUCTION PROCESSES OF THE LAY BUILDER

Vernacular architecture is the term commonly utilized to describe the built forms produced by the lay builder. It apparently refers to an architecture that has not been professionally designed, is folk or native in character, and is peculiar to a specific region or locale. Interest
in this architecture comes about because its existence, when interpreted, is said to provide useful information. In particular, it is asserted that its form, adornment, and its implied construction methods frequently reflect the customary or traditional ways of making and representing things in a locality inhabited by a distinct cultural group. Some claim that there is much to be learned about design from this sort of architecture. Others believe that, because the lay builder places heavy emphasis on function, is generally disposed towards simpler designs, and makes almost exclusive use of local materials, it is quite possible to acquire clear and significant knowledge about how groups interacted with their environments by studying the architecture that results from the lay builder's efforts. Still others go further and maintain that vernacular architecture, when analyzed, can reveal information about shared symbols, and, thus, about symbol systems in general.

If all of this appears to be quite precise, it may only be an illusion. For example, one impression is that the conceptual dividing line between the vernacular class and architecture in general is not at all well set. Furthermore, what this class of architecture encompasses or what it excludes also seems to be open to question. R. W. Brunskill, in his Illustrated Handbook of Vernacular Architecture (2nd edition, Faber & Faber, 1978, pp. 25-26), describes the nature of vernacular architecture in this way:

"... the ultimate in vernacular architecture will have been designed by an amateur, probably the occupier of the intended building, and one without any training in design; he will have been guided by a series of conventions built up in his locality, paying little attention to what may be fashionable on an international scale. The function of his building would be the dominant factor, aesthetic considerations, though present to some small degree, being quite minimal; tradition would guide constructional as well as aesthetic choice, and local materials would be used as a matter of course, other materials being chosen and imported quite exceptionally."

Even if equipped with Brunskill's benchmark definition, there still exists a need for additional discussion, contemplation, and interpretation, particularly in the basic areas of establishing the utility of this concept in design issues and clarifying its significance to person-behavior-environment relationships. C. Saccopoulos and M. Mitropoulos recognize this need and, for that reason, have organized the two symposia on vernacular architecture. One of these is specifically designed to re-examine the theoretical issues surrounding vernacular architecture while the intention in the other symposium is to evaluate field research in terms of these issues.

While the organizing theme for the theoretical symposium is the relationship between culture and architecture, each of the contributing papers tackle a more specific issue. One, for example, examines the variety of approaches (e.g., "aesthetic," "technological," and "social and cultural") utilized by different groups as conceptual frameworks in their attempts to comprehend this class of architecture. Its intent is to delimit or uncover some sort of comprehensive approach or theory that would specify vernacular architecture in terms of its alleged distinctiveness, its evolution, and its meanings. A second contribution looks at the current definitions of vernacular architecture, examines the assumptions about its nature, and discusses the meanings it is likely to contain or reflect about symbols and symbol systems. The manner in which vernacular architecture and its construction processes, through custom and ritual knowledge, become implicit forms of communications about shared, unspoken beliefs is the topic of interest for a third contributor. The final contributor to the theory symposium discusses the influence of vernacular design processes on high-style architectural movements, particularly with regard to past and present architectural revivals.

The "Field Research" symposium on vernacular architecture is organized around four empirical works, each of which focuses on a specific locale. "Culture of place" is the theme of one of them. Its author investigates the exterior frontal spaces of houses in three distinct settings in an effort to illustrate how such spaces exhibit cultural themes related to the meaning of place, the shaping of place and the behavior in place. Utilizing a case study, a second contributor illustrates the changes that are likely to take place in forms associated with a group's settlements when
changes have taken place in the group's culture. A third contributor examines settlements containing deliberately designed-in communication spaces ("semi-private/public" types) geared toward facilitating that sort of exchange, and then discusses how subsequently installed communication networks altered the lifestyle previously associated with that vernacular architectural provision for communication. The final contributor in this field research symposium looks at miniature chapels that have been constructed as memorials to auto accident victims and illustrates how, for this instance and contrary to common belief, lay builders of vernacular buildings have turned to high-style architecture for design inspiration.

The EDRA 1983 Co-editors
Doug Amedeo
James Griffin
James Potter
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman, Irwin</td>
<td>273, 274</td>
<td>Edwards, Susan</td>
<td>239</td>
</tr>
<tr>
<td>Amiel, Maurice</td>
<td>172</td>
<td>Eley, Petter</td>
<td>167</td>
</tr>
<tr>
<td>Anderson, James R.</td>
<td>239, 273, 274</td>
<td>Ellis, Peter</td>
<td>266</td>
</tr>
<tr>
<td>Archea, John</td>
<td>246, 259, 262, 277</td>
<td>Ellis, Russ</td>
<td>270</td>
</tr>
<tr>
<td>Bailey, E. G.</td>
<td>240</td>
<td>Faletti, Martin V.</td>
<td>251</td>
</tr>
<tr>
<td>Baird, Nancy</td>
<td>289</td>
<td>Falta, Patricia Ladia</td>
<td>215</td>
</tr>
<tr>
<td>Bakunas, Edward</td>
<td>182</td>
<td>Farbstein, Jay</td>
<td>257, 258, 276, 282</td>
</tr>
<tr>
<td>Bechtel, Robert B.</td>
<td>13, 276</td>
<td>Feiner, Joel</td>
<td>247</td>
</tr>
<tr>
<td>Beck, Robert</td>
<td>264</td>
<td>Feldman, Roberta</td>
<td>241</td>
</tr>
<tr>
<td>Becker, Franklin</td>
<td>248, 266</td>
<td>Ferguson, Glenn S.</td>
<td>120</td>
</tr>
<tr>
<td>Berleant, Arnold</td>
<td>269</td>
<td>Filipovitch, Anthony</td>
<td>248</td>
</tr>
<tr>
<td>Bienn, Brian</td>
<td>288</td>
<td>Francis, Mark</td>
<td>261, 267, 305</td>
</tr>
<tr>
<td>Bogart, Vincent</td>
<td>247</td>
<td>Gale, Nathan</td>
<td>65</td>
</tr>
<tr>
<td>Bates, William</td>
<td>255</td>
<td>Garrott, Jay G.</td>
<td>310</td>
</tr>
<tr>
<td>Bonanni, Barbara Rose</td>
<td>291</td>
<td>Geddis, Barbara L.</td>
<td>249</td>
</tr>
<tr>
<td>Boyd, Virginia T.</td>
<td>147, 161</td>
<td>Girot, Christopher</td>
<td>305</td>
</tr>
<tr>
<td>Brill, Michael</td>
<td>266, 277</td>
<td>Gobster, Paul H.</td>
<td>105</td>
</tr>
<tr>
<td>Brower, Sidney</td>
<td>241, 248, 261</td>
<td>Goldman, Mark</td>
<td>282</td>
</tr>
<tr>
<td>Brown, Barbara</td>
<td>262</td>
<td>Goldsmigh, Selwyn</td>
<td>198</td>
</tr>
<tr>
<td>Brown, Calvin R.</td>
<td>295</td>
<td>Golledge, Reginald G.</td>
<td>188</td>
</tr>
<tr>
<td>Buchman, Sally</td>
<td>146</td>
<td>Goltzman, Susan M.</td>
<td>303</td>
</tr>
<tr>
<td>Burger, Charles</td>
<td>256</td>
<td>Gorenflo, Larry</td>
<td>310</td>
</tr>
<tr>
<td>Butterfield, Dorothy I.</td>
<td>91, 239</td>
<td>Graff, Charlan L.</td>
<td>283</td>
</tr>
<tr>
<td>Byerts, Thomas O.</td>
<td>292</td>
<td>Grant, Christin Nuttall</td>
<td>263, 271</td>
</tr>
<tr>
<td>Campanella, Angelo</td>
<td>263</td>
<td>Grant, Myron</td>
<td>243, 245</td>
</tr>
<tr>
<td>Campbell, Anne</td>
<td>183</td>
<td>Groot, Linda N.</td>
<td>29, 154, 160</td>
</tr>
<tr>
<td>Campbell, David E.</td>
<td>302</td>
<td>Gustafson, A. William</td>
<td>314</td>
</tr>
<tr>
<td>Carr, Stephen</td>
<td>261</td>
<td>Hanna, Becky</td>
<td>239</td>
</tr>
<tr>
<td>Carswell, J. William</td>
<td>311</td>
<td>Hannson, Robert O.</td>
<td>246</td>
</tr>
<tr>
<td>Case, Duncan</td>
<td>237</td>
<td>Hansvick, Christine L.</td>
<td>246</td>
</tr>
<tr>
<td>Casey, Kevin</td>
<td>239</td>
<td>Hardie, Graeme J.</td>
<td>173, 273, 274</td>
</tr>
<tr>
<td>Chenoweth, Richard E.</td>
<td>142, 145</td>
<td>Hase, Betty</td>
<td>272</td>
</tr>
<tr>
<td>Choi, Jaepil</td>
<td>310</td>
<td>Hassinger, James R.</td>
<td>113, 262</td>
</tr>
<tr>
<td>Clearwater, Yvonne</td>
<td>277</td>
<td>Hayward, D. Geoffrey</td>
<td>264, 276</td>
</tr>
<tr>
<td>Cohen, Annabel, J.</td>
<td>263</td>
<td>Heath, Paul</td>
<td>252, 253, 254</td>
</tr>
<tr>
<td>Cole, Joris</td>
<td>183, 184</td>
<td>Hecht, Peter R.</td>
<td>147</td>
</tr>
<tr>
<td>Connell, Bettye Rose</td>
<td>289</td>
<td>Heller, Tamar</td>
<td>292</td>
</tr>
<tr>
<td>Cook, Christine C.</td>
<td>287, 313</td>
<td>Henry, Brian</td>
<td>255</td>
</tr>
<tr>
<td>Cooper, William Douglas</td>
<td>306</td>
<td>Hester, Randolph</td>
<td>261, 270</td>
</tr>
<tr>
<td>Craik, Kenneth</td>
<td>225</td>
<td>Hill, Michael R.</td>
<td>304</td>
</tr>
<tr>
<td>Cuff, Dana</td>
<td>225, 307</td>
<td>Hobbs, Kennett</td>
<td>314</td>
</tr>
<tr>
<td>Danford, Scott</td>
<td>19, 284, 307</td>
<td>Hornberger, Francine</td>
<td>285</td>
</tr>
<tr>
<td>Davis, Gerald</td>
<td>258, 259, 266, 278</td>
<td>Humphreys, David</td>
<td>146</td>
</tr>
<tr>
<td>Dick, James</td>
<td>256</td>
<td>Hurand, Fred</td>
<td>142</td>
</tr>
<tr>
<td>Dickhut, Kathy</td>
<td>145</td>
<td>Husband, Eliza</td>
<td>232</td>
</tr>
<tr>
<td>Dolny, Robert</td>
<td>241, 294</td>
<td>Hyde, Frank W.</td>
<td>291</td>
</tr>
<tr>
<td>Jomar, Dennis E.</td>
<td>311</td>
<td>Hyde, Richard</td>
<td>301</td>
</tr>
<tr>
<td>Jondis, Jonis</td>
<td>240</td>
<td>Iacofana, Daniel S.</td>
<td>267, 303</td>
</tr>
<tr>
<td>Jovey, Kimberly</td>
<td>303</td>
<td>Inman, Marjorie</td>
<td>314</td>
</tr>
<tr>
<td>Dreher, David E.</td>
<td>292</td>
<td>Jockusch, Peter</td>
<td>166, 266</td>
</tr>
<tr>
<td>Duffy, Jacqueline</td>
<td>314</td>
<td>Jones, Byron W.</td>
<td>312</td>
</tr>
<tr>
<td>Duffy, Frank</td>
<td>167, 266, 277</td>
<td>Juhasz, Joseph B.</td>
<td>147</td>
</tr>
<tr>
<td>Edelstein, Mike</td>
<td>237</td>
<td>Julian, David</td>
<td>146</td>
</tr>
<tr>
<td>Edmiston, Tom</td>
<td>252, 253, 254</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ka ymun, Mary</td>
<td>75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanai, Naoki</td>
<td>309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kantrowitz, Min</td>
<td>237,238,258,276,277</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kates, Nancy Cato</td>
<td>272</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keating, John P.</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kent, Fred</td>
<td>261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinney, Jennifer M.</td>
<td>84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kleeman, Walter</td>
<td>266,277</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klein, Stephan</td>
<td>247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh, Jusuck</td>
<td>36,269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Komz, Stephen A.</td>
<td>312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kotz, Ellen</td>
<td>143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kriebel, Marjorie</td>
<td>315</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lang, Jon</td>
<td>48,269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawrence, Roderick J.</td>
<td>170,273,274</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ledewitz, Stefani</td>
<td>311</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lehman, Sheila</td>
<td>247,296</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levi, Dan</td>
<td>238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lewis, David</td>
<td>264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lichtman, Marc</td>
<td>251</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lindell, Michael</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lofland, Lyn</td>
<td>261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorenzo, Ray</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDowell, Kenneth</td>
<td>273,274,313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McKown, Cora</td>
<td>314</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maltz, Nathan J.</td>
<td>248</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marcus, Clare Cooper</td>
<td>167,183,184,270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margulis, Stephen T.</td>
<td>259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Margot, Alexi</td>
<td>168</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marshall, Lynne</td>
<td>263</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matchette, Peggy</td>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maurer, Laurie Mutchnik</td>
<td>183,185</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mayer, Jeffrey P.</td>
<td>312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mazumdar, Sanjoy</td>
<td>308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mazumdar, Shampa</td>
<td>308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miciunas, Gary</td>
<td>303</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitropoulos, Hit</td>
<td>169,172,174,269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moore, Gary</td>
<td>240,276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moore, Robin C.</td>
<td>267,303</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morris, Earl W.</td>
<td>312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozingo, Louise</td>
<td>301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mueller, Gerald</td>
<td>239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murtha, O. Michael</td>
<td>277</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nrohaly, Marianne</td>
<td>146</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasar, Jack L.</td>
<td>141,144,146,160,269,301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ndobisi, Forester</td>
<td>309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newton, Barry</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niemeyer, Shirley M.</td>
<td>312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nohl, Werner</td>
<td>269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norris-Baker, Carolyn</td>
<td>242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olsen, Richard</td>
<td>243,245</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orland, Brian</td>
<td>146</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osgood, Robert T.</td>
<td>264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxley, Diana</td>
<td>273,274</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palmer, James F.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pardee, James D.</td>
<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkhurst, Anne</td>
<td>183</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrose, Prataap</td>
<td>281</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patterson, Arthur</td>
<td>262</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paxson, Lynn</td>
<td>147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedersen, Larry</td>
<td>255</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pershing, Alan</td>
<td>243,245</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peterson, Rebecca L.</td>
<td>184,265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phillips, Ronald G.</td>
<td>291</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preister, Kevin</td>
<td>304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressman, Norman</td>
<td>306</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prestholdt, Perry H.</td>
<td>288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raschko, Bettyann</td>
<td>242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinsel, Ron</td>
<td>257</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reizenstein, Janet</td>
<td>243,245,271,276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ridout, Mollie</td>
<td>142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riley, Robert</td>
<td>171</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rivlin, Leanne</td>
<td>239,261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robertson, Elizabeth</td>
<td>307</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robinson, Julia W.</td>
<td>239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockcastle, Garth</td>
<td>161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rohles, Frederick H., Jr.</td>
<td>312</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rowan, C. Patrick</td>
<td>286</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saarinen, Thomas F.</td>
<td>232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saccopoulos, Christos A.</td>
<td>169,172,174</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saegert, Susan</td>
<td>184,186,248,265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salle, David G.</td>
<td>171</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salem, Greta</td>
<td>265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sancar, Fahriye H.</td>
<td>143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandler, Alan R.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandrisser, Barbara</td>
<td>241,269,294,309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandford, Jon A.</td>
<td>264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanoff, Henry</td>
<td>302</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saff, Mary</td>
<td>256</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schaefer, George</td>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schorr, Janet</td>
<td>238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schrock, Janet M.</td>
<td>313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schweitzer, Edward M.</td>
<td>308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seaton, Richard</td>
<td>297</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seidel, Andrew D.</td>
<td>129,259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sell, James L.</td>
<td>232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shierk, Theodore</td>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shore, Hazel</td>
<td>273</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simmons, Gordon B.</td>
<td>305</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon, Joan</td>
<td>309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith, Michael</td>
<td>252,253,254</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreckelmeyer, Kent F.</td>
<td>304,311</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stanton, Glenn A.</td>
<td>313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stea, David</td>
<td>273</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephens, Mary Ann Parris</td>
<td>84,242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stone, Andrew</td>
<td>261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suther, George N.</td>
<td>264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symes, Martin</td>
<td>162,168</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Szigeti, Francoise</td>
<td>259</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temple, George E.,IV</td>
<td>290</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennyson, Jane</td>
<td>306</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teymur, Nec</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tognoli, Jerome</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valenta, Anette</td>
<td>243,245</td>
<td></td>
<td></td>
</tr>
<tr>
<td>van Oudenallen, Harry</td>
<td>166</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volkman, Nancy J.</td>
<td>305</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren, Lynn Mittelstaedt</td>
<td>302</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeks, James K.</td>
<td>290,293</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weidemann, Sue</td>
<td>239,273,274</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weisman, Leslie Kanes</td>
<td>184,187</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welch, Polly</td>
<td>257,258</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wener, Richard</td>
<td>237,278</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Werner, Carol</td>
<td>273,274</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, Edward</td>
<td>278</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiley, Wayne</td>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willey, Richard</td>
<td>301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wineman, Jean D.</td>
<td>239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winkel, Gary H.</td>
<td>59,243,245</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wise, James A.</td>
<td>246,259,262</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worthington, John</td>
<td>167</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zeisel, John</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zimring, Craig M.</td>
<td>239,271</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>