Towards better quality indoor and outdoor environments

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From where I sit, the city is changing...
Inner Melbourne is growing, but it’s not getting any bigger.
Meeting the challenge of increasing density as we move forward

- Evaluation and research

Source: Preiser (1983)
Meeting the challenge of increasing density as we move forward

1. Our buildings and indoor spaces need to work better

2. Outdoor and shared ‘restorative’ spaces need to work hard

3. It’s all got to be sustainable

4. We need to make change happen
Project: The Nicholson

Researchers: Ralph Horne, Trivess Moore, Jin Woo, Ian Ridley, Megan Nethercote, David Higgins

Funding: Places Victoria, Vic Health

- 2 year project
- Aim:
  - To assess the extent to which The Nicholson serves as a positive model of sustainable urban and community development by emphasizing:
    - economic viability
    - social inclusion
    - resource efficiency
- Methods:
  - Building User Satisfaction (BUS) survey
  - Semi-structured interviews
  - Utility data, Blower door testing
  - Additional data from previous research
Results from the BUS survey

Temperature in summer
Temperature in winter
Lighting
Noise
Air in summer
Air in winter
Surveys usually tell you what, but not why

- Overall liked the design – external and internal
- Only some aware it was modular construction
- All interviewees had issues with summer overheating
- Environmental features were well liked by participants
- Appreciated IGA supermarket on ground level
- Would like other retail spaces to be filled

‘Well I found the summer very uncomfortable. I haven’t got any air conditioning and I went and stayed somewhere else a few times because I couldn’t handle it.’
**Project:** How Indoor Environments Influence Resident Satisfaction in High-rise Apartments

Researchers: Andrew Carre (supervised by Terrence Williamson and Veronica Soebarto)

Funding: PhD Research supervised by The University of Adelaide

- So far …
  - Two focus groups (13 people)
  - Planning broader survey and longitudinal case studies

- Emerging themes
  - Satisfaction evolves over time
  - Satisfaction relates to commitment to the dwelling
  - Satisfaction may be affected by ‘little’ things
  - IEQ is invisible in a good building
  - IEQ often related to ‘building quality’ or ‘construction quality’
  - Space is acknowledged as an ‘economic’ outcome
  - Window coverings play a significant role (especially for renters)
The drivers of residential satisfaction

• Galster (1987) describes a consensus of the “actual-aspirational” approach to resident satisfaction as being related to three sets of factors.
  • 1) objective characteristics of the environment
  • 2) objective characteristics of the residents, and
  • 3) their substantive beliefs, perceptions and aspirations
    • (Galster 1987, p. 543)

• Research needs to consider all of these factors when attempting to assess the success or otherwise

Project: Spaces between buildings – assessment of the quality of public realm

Researchers: Mary Myla Andamon, Andrew Carre, James PC Wong, Callum Logan, Usha Iyer-Raniga

Funding: RMIT-PCPM seed grant
We have just scratched the surface…

- Space partitioned into features
- Utilisation of features studied
Materials work to a provide function beyond the aesthetic
A common challenge of city life involves dealing with noise
- The ‘hum of the city’
- The reversing beeper!

Libraries may provide acoustic ‘solace’ otherwise in accessible to many residents

Need to provide an array of acoustic environments:
- Information access
- Collaboration
- Quiet study
- Early reading and story telling
- Socialising
Project: Comparative LCA of Multi-Storey Apartment Buildings
Researchers: Andrew Carre, Enda Crossin
Funding: Forest and Wood Products Australia and Australand

Product Stage - Climate change impact

<table>
<thead>
<tr>
<th>Product</th>
<th>Study</th>
<th>Reference</th>
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<tr>
<td>Common fitout</td>
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<td>Apartment fitout</td>
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<tr>
<td>Roof system</td>
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<td>22</td>
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<td>Floor system</td>
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<td>Columns, beams, lintels</td>
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<td>Windows</td>
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<tr>
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<td>Internal walls</td>
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<tr>
<td>Core</td>
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<td>15</td>
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<tr>
<td>Substructure</td>
<td>40</td>
<td>53</td>
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<tr>
<td>Total</td>
<td>340</td>
<td>507</td>
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Project: BIPV & BAPV Feasibility study
Researchers: Rebecca Yang, Andrew Carre
Funding: University seed grant

Theoretical Model: Approximately 40% of building load satisfied by solar panels
Matching supply and demand

Theoretical Model:
Approximately 40% of building load satisfied by solar panels

Students coming home and switching on the AC

Building solar exposure

Total electricity (kW) peaks (+) on Mon 03/Feb for Model

Power (kW)
Making change happen

- Evaluation and research are only useful if learnings are considered during the design stage

- Do developers and other stakeholders understand and care about apartment liveability?

Source: Preiser (1983)
**Project: ‘Liveability’ in the Design and Build Process**

Researchers: Sarah Holdsworth
Student Researchers: J. Cooke, S. Matfin

- **Aim:**
  - How is liveability defined in the context of the Melbourne high-rise apartment market and is it considered in design and build process?

- **Methods:**
  - 13 Interviews
    - 3 developers,
    - 4 builders;
    - 2 planner/urban designers and
    - 4 architects

- **Early findings**
  - Cannot define liveability, but can describe factors
    - building amenity (eg. Pool, gym, garden etc.)
    - external amenity (eg. proximity to services)
    - apartment design (eg. daylight, acoustics, storage, etc.)
  - Liveability was not cited as a key influence of design decisions

<table>
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<th>Factor</th>
<th>Sale Price</th>
<th>Banks</th>
<th>Competitors</th>
<th>Purchasers</th>
<th>Sales Agents</th>
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<td>Referenced</td>
<td>83% (n=10)</td>
<td>17% (n=2)</td>
<td>25% (n=3)</td>
<td>50% (n=6)</td>
<td>17% (n=2)</td>
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- Construction contracts can compromise design intent
- Value management often compromises design intent
- Opportunity for improved, flexible polices
Conclusions

• Higher density residential environments are likely to be less tolerant to design shortcomings than more traditional suburban environments
  • We need to make good decisions as we go about catering to an increasing city population
• Making good decisions requires research and evaluation to feed the learning cycle
  • Our buildings and indoor spaces need to work better
  • Outdoor and shared ‘restorative’ spaces need to work hard
  • It’s all got to be sustainable
• We need to understand the pressures and barriers which prevent us from making good decisions
  • We already know a lot about how to get design right, yet we often get it wrong
  • Policies need to be developed which address these shortcomings