The Role of the Imagined User in the Design of Energy-Efficient Extra Care Housing Schemes

Alan Lewis
alan.lewis@manchester.ac.uk
Background

• Extra-care housing
  • enables older people to retain independence
  • ‘own front door’, communal facilities, care available
  • Popular with policy-makers

Aims of the Study

• Implicit in the concept of older people’s housing is an imagined older person
  • What is the role of this imagined user in the provision for thermal comfort in extra-care housing?
  • How does this imagined older user compare with actual users?
Methodology

• Qualitative study

• Interviews conducted to date:
  • 23 occupants of 5 housing schemes (winter)
  • 9 housing providers and architects

• Planned interviews:
  • ‘Summer’ interviews with occupants
  • Further interviews with those involved in designing and managing extra-care housing schemes
### Table 1: Housing Scheme Characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Year Built</th>
<th>SAP Rating (range)</th>
<th>Type</th>
<th>Heating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1970 (r.2011)</td>
<td>87</td>
<td>Tower block</td>
<td>Gas-fired district heating system, under-floor heating</td>
</tr>
<tr>
<td>2</td>
<td>2011</td>
<td>85-90</td>
<td>Small apartment block</td>
<td>Biomass boiler, under-floor heating</td>
</tr>
<tr>
<td>3</td>
<td>2011</td>
<td>83-90</td>
<td>Small apartment block, bungalow</td>
<td>Ground source heat pump, under-floor heating, solar hot water for one unit</td>
</tr>
<tr>
<td>4</td>
<td>1988</td>
<td>61-75</td>
<td>Small apartment block</td>
<td>Electric storage heaters, electric fan heaters, electric emersion heater</td>
</tr>
<tr>
<td>5</td>
<td>1999</td>
<td>55-66</td>
<td>Bungalows</td>
<td>Individual gas-fired boilers, radiators, solar hot water for one unit</td>
</tr>
</tbody>
</table>
Table 2: Occupants: Participant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>Median</th>
<th>(Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>79</td>
<td>(60, 87)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4 (17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>19 (83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social renting</td>
<td>18 (78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leasehold</td>
<td>5 (22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time spent living in housing scheme (months)</td>
<td>7</td>
<td>(2, 168)</td>
<td></td>
</tr>
<tr>
<td>Number of people participant lives with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>18 (78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with spouse/other</td>
<td>5 (22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency¹</td>
<td></td>
<td>17</td>
<td>(3, 20)</td>
</tr>
<tr>
<td>Annual income (£)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single person</td>
<td>17 (74)</td>
<td>10140</td>
<td>(5676, 18088)</td>
</tr>
<tr>
<td>Couple</td>
<td>5 (22)</td>
<td>35000</td>
<td>(10000, 40000)</td>
</tr>
<tr>
<td>Does not handle own finances</td>
<td>1 (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹As measured using the 5-point Barthel index; range from ‘0’ indicating maximum dependency to ‘20’ indicating independent
Impact of Imagined User

- communal heating
- selection of heating controls
- heat emitters (e.g. low surface temperature radiators)
- automatic meter reading
- heating in corridors
- restricted window opening
Imagined Users: Communal Heating

• “...hopefully it, it's so it's economic to run so they can have the heating on as much as they want…” [Housing provider #4]
• “...you can get people with quite severe dementia. We do have some people that will constantly fiddle with boilers…” [Housing provider #4]

Actual Users: Communal Heating

• “My last bill was £47... [in summer] it's about £11... I'm quite happy... in the old house it would have been about £250 a quarter” [Female occupant, aged 64 years]
• “Come next year I will have to learn that again... memory is a big thing with, with appliances” [Female occupant, aged 85 years]
Actual Users: Communal Heating – Thermal Comfort

• “I think it's a thirteen point five duvet... but more often than not I just put it over the end of the bed because it's, it's too warm.”  [Female occupant, aged 64 years; energy efficient scheme]

• “I use two cellular blankets and one woollen blanket on top of it. Well it varies, depending... at one stage last winter I... had a sleeping bag over the lot of the top as well...”  [Male occupant, aged 73 years; energy in-efficient scheme]

• (We will return to this issue...)
Imagined Users: Operation of Heating

• “...using the programmer rather than... using the room stat to switch it on and off, is the preferred way.” [Housing provider #8]

• “When someone moves in... we book an appointment with them... They get a full brochure...” [Housing provider #5]

Actual Users: Operation of Heating

• “[I] leave it on because to fire it up, it costs more”

• INTERVIEWER: “How can you control your heating” PARTICIPANT: “I do it by the thermostat”

• “I have to have it on between thirty and thirty five when the weather's bad...” [Female occupant, aged 71 years]
To increase warm setting press

To switch between warm and cool settings press

To decrease the warm setting press
Imagined Users: Thermostats and Timers

• “it's about making it as simple as possible… so we didn't go down the digital [route]” [Housing provider #6]
• “if you don't pick it up before it happens... it's been installed... Then with hindsight you think, oh I should have changed all those...” [Housing provider #4]

Actual Users: Thermostats and Timers

• “I can't see the markings on them, because it's white on white” [Female occupant, aged 85 years]
• PARTICIPANT’S SON: “I set that... basically the temperature that was in Mum's previous house, we replicated that here.” [Female occupant, aged 87 years]
Imagined Users: Energy Bills

- “[We] recharge through the landlord, and then we can make sure that people do have their heating on” [Housing provider #4]
- “we can see online how much energy people are using [and we can] give them advice.” [Housing provider #6]

Actual Users: Energy Bills

- “I'd like to keep [my utility bills] as low as possible” [Female occupant, aged 76 years; metered energy bill]
- “[The doctor] said you cannot stay where it's cold... Age Concern [said] set it to 21” [Male occupant, aged 66 years]
- “I wouldn't know... how to turn up the thermostat, I've never tried...” [Female occupant, aged 80 years]
Thermal Comfort: New-build extra-care housing schemes often over-heat

- “... timber frame extra-care schemes are generally beginning to overheat because [they are] so... well-insulated [and there is no] cross-flow ventilation... clients are having to put ventilation systems in...”  [Architect #2]
- “I haven't had any heating over the winter... [it was] too hot for me, so I switched it off...”  [Female occupant, aged 85 years]
- “I don't notice there's change in the weather outside, people say how cold it is today, doesn't mean anything to me...”  [Female occupant, aged 80 years]
Initial Findings:

• User representations of older people affect design for thermal comfort
• Ageing has an impact on thermal comfort practices
• Some mismatches found between anticipated scenarios of use and thermal comfort practices
  • These do not necessarily relate to age
• Older occupants of energy-efficient homes rarely experience cold room temperatures
• New-build extra-care housing schemes often over-heat