What do people know about their public transport options?
Investigating memory representations

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Agenda
- Highlights PhD Thesis
- Memory Representations - Paper
- Discussion
**Ease-of-Use in Public Transportation**
– A User Perspective on Information and Orientation Aspects

**Research Framework**

1. What concepts and ideas do people have about the PT system in metropolitan areas?

2. What information and orientation factors within the system enhance “Ease-of-Use”?

3. How can Ease-of-Use of a public transport route be measured?
Methods

How do people learn and experience an unknown PT system?

Exchange students as subjects

- Semi-structured interviews in Stockholm, N=31
- In-depth study, N=1
- Questionnaire in Dresden/Germany, N=156

Methods

Evaluation of new trunk bus line

**Before: Red bus (#46)**
- Traveller interviews, N=541
- Telephone interviews with residents, N=200

**After: Blue trunk bus (#2)**
- Traveller interviews, N=368
- Telephone interviews with residents, N=121
Methods

How to measure Ease-of-Use?

- Develop and test a scale
  - On-board questionnaire to travellers on buses, trunk buses and subways in Stockholm

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PhD Thesis


www.diva-portal.org/kth/theses/abstract.xsql?dbid=4696
What do people know about their public transport options?

Investigating the memory representation of public transport through telephone interviews in a residential area of Stockholm, Sweden

Published: Transportation Vol.35, 4, S.519-538.

Memory Representation

- Three proposed factors that contribute to the extent to which a line is represented in memories
  1) Visibility
  2) Straight route layout
  3) Labelling

<table>
<thead>
<tr>
<th></th>
<th>Commuter train, tram</th>
<th>Trunk bus</th>
<th>Metro*</th>
<th>Suburban bus</th>
<th>Inner-city bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible in the urban area</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- station</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- between stations</td>
<td>✓</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Straight / on main streets</td>
<td>✓</td>
<td>✓</td>
<td>(✓)</td>
<td>(✓)</td>
<td>-</td>
</tr>
<tr>
<td>Labelled / important destination</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>Rank for anchoring in memory</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

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Methods: Sample Selection

- Residential area in inner-city of Stockholm
- Randomised sample of telephone numbers
- Telephone interviews in January 2004
- Standardised interview guideline
- Excluded newcomers

Methods: Interview Guideline

- Estimation of walking distance to the next subway stations and the closest bus stop
- Name of the closest bus stop
- Route-knowledge to well-known and less well-known corridors
- Free associated travel options of a big transfer station
- Recognition tasks about well-known and less well-known places
- Service frequencies of selected lines
- Statistics
Results

- Residents have good knowledge of the PT options along well-known corridors
  - Know the closest bus stop well – but do not always know the exact name
  - Estimate the distances correctly
- Memory representation of lesser known corridors is of a poorer quality

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Results

Service Frequency Estimations

Table 4: Answers to the service frequencies (N=204)

<table>
<thead>
<tr>
<th></th>
<th>Do not know</th>
<th>Right answer (min)</th>
<th>Estimate average (min) (SD)</th>
<th>Difference in min</th>
<th>Difference in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rush hours (weekdays 7-9 and 16-18)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus 46: Jarlaplan - Kungsträdgården</td>
<td>4%</td>
<td>5</td>
<td>6.6 (2.4)</td>
<td>+1.6</td>
<td>+32%</td>
</tr>
<tr>
<td>Metro: Rådmansgatan - Gamla Stan</td>
<td>6%</td>
<td>3</td>
<td>4.9 (2.3)</td>
<td>+1.9</td>
<td>+63%</td>
</tr>
<tr>
<td>Bus 42: Jarlaplan - Karlaplan</td>
<td>8%</td>
<td>11</td>
<td>9.2 (2.7)</td>
<td>-1.8</td>
<td>-16%</td>
</tr>
<tr>
<td>Bus 43: Jarlaplan - Södra station</td>
<td>17%</td>
<td>12</td>
<td>9.9 (3.6)</td>
<td>-2.1</td>
<td>-18%</td>
</tr>
<tr>
<td><strong>Sundays (in the middle of the day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus 46: Jarlaplan - Kungsträdgården</td>
<td>6%</td>
<td>8</td>
<td>14.4 (5.4)</td>
<td>+6.4</td>
<td>+80%</td>
</tr>
<tr>
<td>Metro: Rådmansgatan - Gamla Stan</td>
<td>7%</td>
<td>3</td>
<td>10.1 (4.4)</td>
<td>+7.1</td>
<td>+337%</td>
</tr>
<tr>
<td>Bus 42: Jarlaplan - Karlaplan</td>
<td>10%</td>
<td>15</td>
<td>15.8 (5.0)</td>
<td>+0.8</td>
<td>+5%</td>
</tr>
<tr>
<td>Bus 43: Jarlaplan - Södra station</td>
<td>16%</td>
<td>20</td>
<td>17.4 (5.9)</td>
<td>-2.6</td>
<td>-13%</td>
</tr>
</tbody>
</table>
Results

• No influence of quality of memory representation:
  - gender
  - Age
  - employment status
  - level of education
  - car availability

• Experience increased knowledge:
  - Frequent users had more detailed memory representation
  - Less frequent users also had a considerably- and good
  memory representation

• In Stockholm the knowledge hierarchy was:
  1) commuter train and trunk bus line
  2) metro line
  3) suburban bus
  4) inner-city bus

Results: Organisation of PT knowledge

<table>
<thead>
<tr>
<th>Existence of Public Transport option</th>
<th>Line Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>From A to B</td>
<td>Number</td>
</tr>
<tr>
<td>Existence in town</td>
<td>Colour</td>
</tr>
<tr>
<td>Impression</td>
<td>Destination name</td>
</tr>
<tr>
<td></td>
<td>Type of bus line</td>
</tr>
</tbody>
</table>

Public Transport Mode

- Bus
- Metro
- Train
PhD-Thesis: Advice to PT Industry

1. Maps are important
2. Each single stop = entrance to the system
3. Tourist strategy
4. Newcomer strategy
5. Youth marketing