The Importance of Housing, Accessibility, and Transport Characteristic Ratings on Stated Neighborhood Preference

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The importance of housing, accessibility, and transport characteristic ratings on stated neighborhood preference

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Civil & Environmental Engineering, Portland State University
Friday Transportation Seminar (TRB Presentations)
Portland State University: January 8th, 2016
Introduction

Research Project:

• Understanding Residential Location Choices for Climate Change and Transportation Decision Making

• Improve sensitivity towards preferences, values, and attitudes within our statewide and regional models

• Transportation Research Board, Session 786: Integrated Modeling of Urban Systems: Expanding the Scope of Integration Beyond Land Use and Transportation

This Study:

• How does the rated importance of housing, transportation, and accessibility characteristics influence stated neighborhood preference?
Study Objectives

Develop, administer, and analyze an original stated preference experiment that collects:

- Rated importance for housing, accessibility, and transportation characteristics;
- Stated neighborhood preference; and
- Household and individual socio-demographic attributes
Methods

1. Research Design
   • Neighborhood Transportation Survey (online, choice-based conjoint experiment)
   • Portland metropolitan region (usable sample n = 554)

2. Measures of Interest
   • Stated neighborhood preference
   • Importance ratings of characteristics in residential location decision making process

3. Statistical Analysis
   • Exploratory factor analysis
   • Confirmatory factor analysis
   • Structural equation modeling
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Research Design

Survey instrument components:

a) Household and Individual Characteristics
b) Stated Neighborhood Preference
c) Rate Characteristics by Importance
d) Choice-based Conjoint Experiment
   • Data are not used in this study

<table>
<thead>
<tr>
<th>Wave</th>
<th>Study Area</th>
<th>Households (N)</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Portland Metro</td>
<td>8,000</td>
<td>6.3%</td>
</tr>
<tr>
<td>2</td>
<td>Downtown Portland</td>
<td>1,982</td>
<td>8.1%</td>
</tr>
<tr>
<td>3</td>
<td>Non-Portland, Oregon</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
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Central District

Urban Residential District

Urban Neighborhood

Suburban Neighborhood

<table>
<thead>
<tr>
<th>Housing</th>
<th>Central District</th>
<th>Urban Residential District</th>
<th>Urban Neighborhood</th>
<th>Suburban Neighborhood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multifamily units in high-rises</td>
<td>Multifamily units in mid-rises</td>
<td>Low-rises &amp; Single-family units</td>
<td>Single-family units</td>
</tr>
<tr>
<td>Rent or Own</td>
<td>Predominately renters</td>
<td>Mix of renters and owners</td>
<td>Mostly owners</td>
<td>Predominantly owners</td>
</tr>
<tr>
<td>Parking</td>
<td>Off-street parking (paid, secure)</td>
<td>Off-street parking (paid, secure)</td>
<td>On-street parking (free, unsecure) &amp; Off-street parking (free, secure)</td>
<td>On-street parking (free, unsecure) &amp; Off-street parking (free, secure)</td>
</tr>
<tr>
<td>Transportation Accessibility</td>
<td>High multimodal access to regional and local centers</td>
<td>Reasonable multimodal access to regional and local centers</td>
<td>Limited access to regional centers &amp; modest public transit network</td>
<td>Sparse public transit</td>
</tr>
<tr>
<td>Destination Accessibility</td>
<td>Retail, services, &amp; entertainment within a maximum of 1/8 mile</td>
<td>Retail, services, &amp; entertainment within a maximum of 1/4 mile</td>
<td>Retail, services, &amp; entertainment within a maximum of 1 mile</td>
<td>Retail &amp; service along arterials within 2 to 3 miles</td>
</tr>
</tbody>
</table>
Characteristics of housing, accessibility, and transportation “that you may consider when deciding where to live”

<table>
<thead>
<tr>
<th>Level of importance (% of Respondents, N = 529 to 542)</th>
<th>Very (must have)</th>
<th>Somewhat (would like to have)</th>
<th>Not at all (not a factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owning a house/condo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large living space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detached single-family home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private yard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Privacy from my neighbors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living at ‘center of it all’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to parks and recreational areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to highways/freeways</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variety of transportation options</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking to bus/rail stops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-street parking at local destinations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated parking at your residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking to nearby places</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biking to nearby places</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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   • Exploratory factor analysis
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Statistical Analysis

Exploratory Factor Analysis (EFA)

Confirmatory Factor Analysis (CFA)

Part I: Constructs ↔ Neighborhood Types

Part II: SES ↔ Constructs ↔ Urban Neighborhood

Structural Equation Modeling (SEM)
Statistical Analysis

Exploratory Factor Analysis (EFA)

Structural Equation Modeling (SEM)
  Part I: Constructs ↔ Neighborhood Types

Confirmatory Factor Analysis (CFA)

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Statistical Analysis

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  - Part I: Constructs ↔ Neighborhood Types

Confirmatory Factor Analysis (CFA)

Structural Equation Modeling (SEM)
  - Part II: SES ↔ Constructs ↔ Urban Neighborhood
Confirmatory Factor Analysis ($\beta$)

Model Summary:

- $\chi^2$ (df): $67.48$ (13)
- p-value: $0.000$
- CFI: $0.987$
- TLI: $0.980$
- RMSEA: $0.088$

* Reverse Coded

Graph:

- Single-Family Dwelling
- Private Yard
- Center-of-it-All *
- Walking to nearby places
- Walk to Transit
- Variety of Transport Options
- Dedicated Parking at Home *

Path Coefficients:

- Single-Family Dwelling: 0.95
- Private Yard: 0.85
- Center-of-it-All *: 0.71
- Walking to nearby places: 0.87
- Walk to Transit: 0.85
- Variety of Transport Options: 0.83
- Dedicated Parking at Home *: 0.54

Factor Loadings:

- SF Dwelling Importance: 0.95
- Non-auto Access Importance: -0.73
Statistical Analysis

**Exploratory Factor Analysis (EFA)**

**Structural Equation Modeling (SEM)**

*Part I:*
Constructs ↔ Neighborhood Types

**Confirmatory Factor Analysis (CFA)**

**Structural Equation Modeling (SEM)**

*Part II:*
SES ↔ Constructs ↔ Urban Neighborhood
Stated Neighborhood Preference (β)

Model Summary:

χ² (df): 125.15 (33)
p-value: 0.000

CFI: 0.983
TLI: 0.972
RMSEA: 0.071

* Reverse Coded
Statistical Analysis

Exploratory Factor Analysis (EFA)

Structural Equation Modeling (SEM)
  Part I: Constructs ↔ Neighborhood Types

Confirmatory Factor Analysis (CFA)

Structural Equation Modeling (SEM)
  Part II: SES ↔ Constructs ↔ Urban Neighborhood
Urban Neighborhood Preference (β)

SF Dwelling Importance

URBAN N’HOOD

Non-auto Access Importance

HH Size: 1 member

HH Size: 3 members

HH Size: 4 + members

HH Income: $0 - $24,999

HH Income: $25,000 - $49,999

HH Income: $100,000 +

Age: 18 - 24 years

Age: 35 - 44 years

Age 65 + years

Model Summary:

χ² (df): 109.37 (76)  
*p-value: 0.01

CFI: 0.96  
TLI: 0.95  
RMSEA: 0.03

-- -- Paths into latent factors

P < 0.05 Paths shown
Traced paths of unstandardized coefficients to:

<table>
<thead>
<tr>
<th>HHSIZE</th>
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<th>-3.55</th>
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<tbody>
<tr>
<td></td>
<td>2</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>4+</td>
<td></td>
</tr>
</tbody>
</table>

| INCOME   | <25K   | 0.24 |
|          | 25-50K | -0.43 |
|          | 50-100K|       |
|          | >100K  | -0.11 |

| AGE      | 18-34  | 0.44 |
|          | 35-44  | 0.44 |
|          | 45-64  |       |
|          | 65+    | -0.12 |
|          | Single-Family Dwelling | -1.11 |
|          | Non-Auto Access        | -0.26 |
Traced paths of unstandardized coefficients to:

**Single-Family Dwelling Importance**

<table>
<thead>
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<th>HHSIZE</th>
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<th>4+</th>
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<tbody>
<tr>
<td>INCOME</td>
<td>&lt;25K</td>
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<tr>
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<td>25-50K</td>
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<td></td>
<td>50-100K</td>
<td>0.68</td>
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</tr>
<tr>
<td></td>
<td>&gt;100K</td>
<td>2.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>18-34</td>
<td>-3.65</td>
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<td></td>
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<td></td>
<td>35-44</td>
<td>-2.13</td>
<td></td>
<td></td>
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<td></td>
<td>45-64</td>
<td>-2.53</td>
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<tr>
<td></td>
<td>65+</td>
<td>-3.56</td>
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**Non-Auto Access Importance**

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</thead>
<tbody>
<tr>
<td>INCOME</td>
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<td></td>
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Discussion

• Analysis suggests socio-demographic characteristics are not necessarily proxy measures for tastes and values in stated neighborhood preferences.
• Market segments influencing stated neighborhood preferences and rated importance of characteristics more complex than socio-demographics.
• Need for value, preference, and attitudinal data is growing.
• Must continue to support collection of this information in travel surveys.
Study Limitations

• Individual responses likely fail to reflect a joint decision-making process involving all household members

• Unconstrained neighborhood preference

• Sample size restricts interaction effects

• Evaluate for the need to segment characteristics rated
  • Example: Single-family dwelling into “living in a SF dwelling to own for an investment” and “living in a SF dwelling for the space”
Future Directions

• Latent class analysis and testing ordinal outcomes to further explore market segments

• Analysis of choice-based conjoint experiment

• Constrained vs. unconstrained neighborhood preference
  • Role of economic factors

• How do importance ratings influence preferences in other metro regions?

• How does the influences of importance ratings change over time?
Questions?

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