Cycling by Choice or Necessity? Exploring the Gender Gap in Bicycling in Oregon

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Cycling by choice or necessity? Exploring the gender gap in bicycling in Oregon

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Portland State University

Friday Transportation Seminar Series
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Gender gap in bicycling


Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Danish Ministry of Transport (2005); Statistics Netherlands (2005); Australian Bureau of Statistics (2007); Department for Transport (2007) and information provided directly by bike planners in Canadian provinces and cities.
Gender gap in bicycling

Gender gap in bicycling

- Goal: to understand bicycling’s gender gap
- Importance of closing gender gap
  - Health
  - Well-being
  - Access to jobs, services, and community
Gender gap in bicycling

• Explanations
  – Bicycle facility preferences & safety perceptions
  – Household responsibilities & time constraints
  – Social normative gender roles

https://www.flickr.com/photos/krawcowicz/4279213591/
https://www.flickr.com/photos/bike/196792901
https://www.flickr.com/photos/krawcowicz/4279213591/
Our hypotheses

- Household maintenance responsibilities:
  - Women with children $\rightarrow$ ↓ bicycling
  - Women with maintenance activities $\rightarrow$ ↓ bicycling
  - Single women $\rightarrow$ ↑ bicycling

- Limited means and mobility options:
  - Low-income women $\rightarrow$ ↑ bicycling
  - Women with ↓ vehicles $\rightarrow$ ↑ bicycling
Method & data

• Method
  – Travel behavior: cross-sectional, one-day
  – Bicycle use by gender across demographic and household variables
  – For any characteristic, looked for reduced or increased gender gap in bicycling
  – Suggest possible interventions; or identify target populations for interventions
Method & data

• Data
  – One-day, household-based, travel diary survey
  – Weighted
  – 30,090 adults (age 18+)

2009–2011
Oregon Household Activity Survey (OHAS)
Method & data

• Bivariate analysis
  – Pearson’s chi-squared tests of independence, two-way contingency tables

<table>
<thead>
<tr>
<th>Bicycle use</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made a bicycle trip</td>
<td>2.8%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Normally commuted by bicycle</td>
<td>(453)</td>
<td>(768)</td>
</tr>
<tr>
<td>Normally commuted by bicycle</td>
<td>2.2%</td>
<td>4.8%</td>
</tr>
<tr>
<td>(356)</td>
<td></td>
<td>(665)</td>
</tr>
<tr>
<td>Bicyclists</td>
<td>3.6%</td>
<td>7.4%</td>
</tr>
<tr>
<td>(590)</td>
<td></td>
<td>(1,023)</td>
</tr>
</tbody>
</table>
Results

Percentage of bicyclists by gender for demographics

- **Number of people in household**
  - Women: 1.5%, Men: 7.9%
  - Women: 0%, Men: 7.3%
  - Women: 4.1%, Men: 6.8%
  - Women: 3.3%, Men: 2.9%

- **Number of children in household**
  - Women: 3.6%, Men: 8.2%
  - Women: 6.8%, Men: 6.2%
  - Women: 3.3%, Men: 2.1%

- **Presence of children aged 6-11 in household**
  - Women: 7.4%, Men: 9.2%
  - Women: 3.6%, Men: 9.2%
  - Women: 4.1%, Men: 7.0%

Gender gap in bicycling – Method & data – Results – Discussion
Results

Percentage of bicyclists by gender for socioeconomics

<table>
<thead>
<tr>
<th>Worker status</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>No</td>
<td>0.9%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Not a HS grad</td>
<td>0.4%</td>
<td>4.8%</td>
</tr>
<tr>
<td>HS grad, some college</td>
<td>2.4%</td>
<td>4.4%</td>
</tr>
<tr>
<td>College grad</td>
<td>6.0%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education level</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0–35k</td>
<td>3.0%</td>
<td>8.5%</td>
</tr>
<tr>
<td>$35–75k</td>
<td>3.8%</td>
<td>6.8%</td>
</tr>
<tr>
<td>$75+</td>
<td>3.8%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

Gender gap in bicycling – Method & data – Results – Discussion
### Results

#### Gender gap in bicycling

- **Method & data**
- **Results**
- **Discussion**

#### Percentage of bicyclists by gender for mobility characteristics

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver license holding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7.4%</td>
<td>7.2%</td>
</tr>
<tr>
<td>No</td>
<td>3.9%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Number of vehicles per licensed driver in household</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>16.6%</td>
<td>11.7%</td>
</tr>
<tr>
<td>0.01–0.99</td>
<td>15.6%</td>
<td>9.4%</td>
</tr>
<tr>
<td>1+</td>
<td>5.1%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Number of bicycles per person in household</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01–0.99</td>
<td>7.4%</td>
<td>14.2%</td>
</tr>
<tr>
<td>1</td>
<td>16.3%</td>
<td>16.3%</td>
</tr>
<tr>
<td>1.01+</td>
<td>23.0%</td>
<td></td>
</tr>
</tbody>
</table>
Results

Percentage of bicyclists by gender for trip and activity characteristics

- Number of trips for work and/or school
- Time spent at work and/or school
- Number of trips for maintenance activities
- Time spent in maintenance activities
- Number of trips for escorting

<table>
<thead>
<tr>
<th>Category</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of trips for work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1.1%</td>
<td>6.3%</td>
</tr>
<tr>
<td>1+</td>
<td>5.4%</td>
<td>5.0%</td>
</tr>
<tr>
<td>1–240</td>
<td>2.5%</td>
<td>6.8%</td>
</tr>
<tr>
<td>241+</td>
<td>8.2%</td>
<td>6.6%</td>
</tr>
<tr>
<td>1</td>
<td>4.5%</td>
<td>5.4%</td>
</tr>
<tr>
<td>1–30</td>
<td>2.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>31+</td>
<td>3.7%</td>
<td>5.8%</td>
</tr>
<tr>
<td>1+</td>
<td>2.2%</td>
<td>7.7%</td>
</tr>
<tr>
<td>1+</td>
<td>3.6%</td>
<td>6.3%</td>
</tr>
<tr>
<td>0</td>
<td>0%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>
Discussion

• Women, household roles, and bicycling
  – Household maintenance trip-making; time spent on maintenance activities:
    • Women less likely to bicycle; men more likely.
    • Women made more maintenance trips, and spent more time on maintenance activities.
  – Presence of children:
    • Women with 2+ children more likely to bicycle.
    • Women with children aged 6–11 slightly less likely to bicycle; men more likely.
Discussion

• Bicycling as a choice
  – Women with more economic means and mobility options were more likely to bicycle:
    • ↑ income, employed, Friday, driver license, motor vehicle access, ↑ bicycles.

• Bicycling (or not) by necessity
  – Women with less economic means and limited mobility options were less likely to bicycle:
    • < HS degree, not working, low-income HH, no work/school trips, no driver license, zero-vehicle HH.
Discussion

• Potential policy implications
  – Target low-bicycling women:
    • Living alone or in single adult HH, < HS education, not working, no driver license, and/or living in low-income or zero-vehicle HH.
  – Interventions:
    • Infrastructure installations, awareness-raising, training, skills-building, and social events.
Discussion

• Future work
  – Multivariate model of bicycling (gender × other variables)
  – Multi-day travel survey, longitudinal data
  – Data on built environment, bicycle facilities, safety, attitudes and preferences
  – External validation of findings (beyond Oregon)
  – Supplementary qualitative interviews, case studies, …, to ask: Why?
Questions?

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