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Factors Associated with the Bicycle Commute Use of Newcomers: Analysis of the 70 Largest U.S. Cities

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Factors Associated with the Bicycle Commute Use of Newcomers:
An analysis of the 70 largest U.S. Cities

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January 2015
Newcomers and Bicycles

Factors Associated with the Bicycle Commute Use of Newcomers

Photo Credit: Daveena Tauber
Presentation Outline

– Bicycles and Newcomers to Portland
– Why Do Newcomers Matter?
– Current Study: Newcomers to Large Cities
  – Data and Methodology
  – Results from Statistical Analysis
  – Conclusions & Limitations
Background on Bicycling

- Benefits of bicycling are becoming well known.
- Cities are making substantial investments to encourage bicycle use.
- Levels of bicycle use are increasing.
  - Since 2000, bicycle commuting in the U.S. has increased by 62%\(^1\)
  - Largest percentage increase of all commuting modes
- Some cities are seeing larger increases in bicycle use than others.

\(^1\) 2000 US Census Decennial Survey & 2012 ACS 1-year estimates
Percent Change in Bicycle Commute Use for Selected Cities, 2000-2011

Newcomers to Portland

All things being equal, the odds of a Portland newcomer (i.e. someone who moved within the past year) bicycling to work were 50% greater than those of a pre-existing resident.

Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates
Newcomers in Major U.S. Cities


- **Newcomer Population:** 1.7%
- **Total Population:** 0.9%

Newcomers Share: 70 Largest U.S. Cities, 2007-2011

- **Bicycle Population:** 7.6%
- **Total Population:** 4.1%

Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates
Factors Associated with the Bicycle Commute Use of Newcomers

Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates
Cities are fighting to attract bicyclists

“... I expect not only to take all of their [Portland and Seattle’s] bikers but I also want all the jobs that come with this.”

– Chicago Mayor Rahm Emanuel, 2012²

“Mayor Rahm Emanuel, when he announced bike routes in downtown Chicago, called out Seattle, saying he wanted our bikers and our tech jobs. We’re going to work to keep them here.”

– Seattle Mayor Mike McGinn, 2013³

² gridchicago.com December 14, 2012
³ seattlebikeblog.com February 20, 2013
Research Goals

Why this study is important:

– Explores the relationship between bicycle use and inter-regional self-selection (i.e. newcomers)

– Provides a greater understanding of why and how some cities are attracting bicycle users

– Allows cities to gauge the types of individuals they are attracting when targeting bicycle users
**Data and Methods**

**Dataset**: American Community Survey (ACS) Public Use Microdata Sample (PUMS) 2007-2011 5-year estimates

**Sample**: Employed *newcomers* in 70 most populous US cities in 2012

**Independent Variables**: Individual level demographic factors and city-wide commuting levels

**Bicycle infrastructure**: Total miles of bicycle lanes and paths per square mile of land (Buehler & Pucher, 2012)

**Dependent Variable**: Bicycle commuter

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Data Sample Definitions

**Bicycle commuter** - An individual who self-reported that they used a bicycle as their primary means of transportation to work

- Bicycle commute use:
  “How did this person usually get to work LAST WEEK?”  

**Newcomer** - An individual who moved to a new metropolitan region within the past year

- Newcomer status:
  “Did this person live in this house or apartment 1 year ago?”

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5 2011 ACS
6 Ibid
# Descriptive Results

## 70 Largest U.S. Cities, 2007-2011

<table>
<thead>
<tr>
<th>Socio-Demographics</th>
<th>ALL Newcomers</th>
<th>Newcomer Bicyclists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>723,004</td>
<td>14,231</td>
</tr>
<tr>
<td>Bicycle Commute Use</td>
<td>1.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Median Age</td>
<td>33</td>
<td>29</td>
</tr>
<tr>
<td>Sex (Male)</td>
<td>51%</td>
<td>65%</td>
</tr>
<tr>
<td>Race (White, Non-Hispanic)</td>
<td>59%</td>
<td>78%</td>
</tr>
<tr>
<td>Relationship Status (Single/Never Married)</td>
<td>59%</td>
<td>75%</td>
</tr>
<tr>
<td>Educational Attainment (Bachelor's+)</td>
<td>37%</td>
<td>60%</td>
</tr>
<tr>
<td>Median Income</td>
<td>$14,000</td>
<td>$19,200</td>
</tr>
</tbody>
</table>

Source: 2007-2011 ACS PUMS 5-year Estimates
## Descriptive Results

### Factors Associated with the Bicycle Commute Use of Newcomers

Source: 2007-2011 ACS PUMS 5-year Estimates

<table>
<thead>
<tr>
<th>Regional Variables</th>
<th>ALL Newcomers</th>
<th>Newcomer Bicyclists</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>East North Central</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>West North Central</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>12%</td>
<td>7%</td>
</tr>
<tr>
<td>East South Central</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>West South Central</td>
<td>19%</td>
<td>10%</td>
</tr>
<tr>
<td>Mountain</td>
<td>12%</td>
<td>15%</td>
</tr>
<tr>
<td>Pacific</td>
<td>24%</td>
<td>41%</td>
</tr>
</tbody>
</table>

70 Largest U.S. Cities, 2007-2011

Factors Associated with the Bicycle Commute Use of Newcomers
Where Newcomers Move: Bicycle Infrastructure

Source: 2007-2011 ACS PUMS 5-year Estimates
Where Newcomers Move: Pre-Existing Bicycle Use

Source: 2007-2011 ACS PUMS 5-year Estimates
Factors Associated with the Bicycle Commute Use of Newcomers

Model 1: Demographics

- Male
- White (non-Hispanic)
- College Education
- Single/Never Married
- Age
- Income

Factors related to a newcomer’s bicycle commute use
Factors related to a newcomer’s bicycle commute use

Model 2: + Built Environ.

Male
White (non-Hispanic)
College Education
Single/Never Married
Age
Income
Built Environment

Factors Associated with the Bicycle Commute Use of Newcomers

Portland State University
Factors Associated with the Bicycle Commute Use of Newcomers

Model 3:
+ Bicycle Culture

Factors related to a newcomer’s bicycle commute use

- Male
- White (non-Hispanic)
- College Education
- Single/Never Married
- Age
- Income
- Built Environment
- Bicycle Culture

OR
Factors Associated with the Bicycle Commute Use of Newcomers

Binary Logistic Regression Results

Model 3a:
+ Bicycle Culture

Factors related to a newcomer’s bicycle commute use:
- Male
- White (non-Hispanic)
- College Education
- Single/Never Married
- Age
- Income
- Built Environment
  - Bicycle Culture
    - Medium
    - High
    - Very High

Factors Associated with the Bicycle Commute Use of Newcomers
Conclusion and Discussion

Newcomers have much greater odds of being bicycle commuters if they are... Male and White. It doesn’t hurt if they are single or college educated.

Photo Credit: Mark Kenseth
Bicycle infrastructure appeared to only play a role in predicting newcomer bicycle use when pre-existing levels of bicycle use were very low.

The greatest overall determinant of newcomer bicycle use was...

pre-existing levels of bicycle use.
Conclusion and Discussion

Bicyclists like being near other bicyclists.
  – Safety in numbers
  – Bicycle culture
  – Other lifestyle amenities

Bicycle infrastructure has a limited ability to attract new bicyclists.
  – Infrastructure usually lags behind demand
  – Not all bicycle infrastructure is created equal
  – U.S. bicycle infrastructure is not state-of-the-art
Limitations

– Work trips only make up 22% of all household trips\(^7\).
– When does a newcomer become a long-time resident?
– Are cities ‘magnets’ or ‘catalysts’ for bicycle use?

\(^7\) 2009 National Household Travel Survey
Limitations: ACS

- Sample reliability and margins of error
  - Can only ‘slice and dice’ the data in so many ways
  - We miss out entirely on smaller populations
- Data from 5-year estimates aren’t ‘fresh’
  - Bicycle use can dramatically change in 5 years
- PUMS data masks variations within a city
  - Bicycle use and migration patterns aren’t evenly distributed within cities
Factors Associated with the Bicycle Commute Use of Newcomers