Gender differences in digital layers of cities

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Gendered urban geographies:

Studying the role of space and place in shaping the diversity of gender relations throughout the world.

Nancy Duncan
Janice Monk
Doreen Massey

Focus of gendered geographies today:

1. The design/use of urban/rural environment
2. Third world development
3. Regional economic restructuring
4. Changing political geographies
5. Pedagogy
6. Migration
7. Accessibility, mobility and spatial behaviour
8. Medical geography and health studies
Gender-aware Urban Planning:

“Women-Work-City” in Vienna:
- Safe public spaces - additional lighting...
- Better accessibility for pedestrian – sidewalks, ramps...
- Quality of stay -

Gendered space-time behaviour

- women tend to commute less than men, although men’s and women’s residences are not spatially segregated (Fernandez and Su, 2004)
Gendered Spatial Mismatch:

One unexpected result is that full-time employed women travel longer distances to work than men.

*Kwan M-P 1999 Gender, the homework link, and space-time patterns of non-employment activities Economic Geography 75 370–94*

Impact of ICT on travel & gender balance

Cotten, et al 2009. Old wine in a new technology, or a different type of digital divide?, New Media and Society 11(7):1163-1186

ICT – and urban space
Mobile phone based methods & Examples from gender studies in Estonia

1. Active Mobile Positioning = tracking
Active mobile positioning:

Mobile phone based tracking:

*pinpoint phone 50 xxxx every 5 min...*

Contract & questionnaire with respondents

Smartphone based tracking:

Special app-s for tracking

Contract with respondent

GPS quality data + phone use data

Phone based questionnaires

YouSense
Sensors in Android phone:

Smartphone based questionnaires:
Movement, phone use, sensor data
+ Questions with voice, sms, special queries

„Location aware“ questionnaires, travel diaries

- you entered Vienna, what is purpose...“
- you met with Birgit, what is purpose...“
Gender differences in space–time mobility patterns in a postcommunist city: a case study based on mobile positioning in the suburbs of Tallinn

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Received 1 April 2011; in revised form 25 June 2012

Abstract. The reflection of gender roles in spatial mobility has been in the research focus of geographers as these issues are related to important aspects of the spatial organisation of society and planning such as the location of activities and services, the use

Objective

To study gender differences in space-time behaviour in new suburban communities in Estonia.
In post-socialist countries, materialistic values dominate – hard work, physical well-being, limited tolerance and traditional gender roles.

Scandinavian countries, which Estonians would like to follow, are famous for independence, discretion, tolerance, solidarity, sufficient time for leisure and friends and family, and gender equality.

(Inglehart 1997)

Data

The study is based on the New Residential Areas Survey 2006 in the suburban municipalities around Tallinn.

- 600 interviews (TNS Emor)
- 277 positioned people during 8 days using SPM (Positium LBS)
Daily locations of respondents

City centre are dominating women’s working places (57%).

Housewives in suburbs.

Distance

Distance between home and working place: 16.1 km men, 14.4 km women.

Indiv. cumulative sum travelled km:
- **Working days**: men 75.6 km, women 54.7 km.
- **Weekends**: men 67.6 km, women 59.6 km.
Timing the trips

The diurnal rhythm of activities is quite similar for both men and women.

Transportation usage

90% of all trips in the new suburban communities were made by car.

Men are more car-centred than women.

Women are in majority in using more public transportation and soft transportation.
2. Secondary data or passive mobile positioning data

Memory files of Mobile Network Operators:

Call detail records (CDR) – location and time of call and number of respondent
Call Detail Record – CDR

**ID** (phone ID)
Place
Time

<table>
<thead>
<tr>
<th>ID</th>
<th>Event</th>
<th>Time</th>
<th>Cell ID</th>
<th>Receiver ID</th>
<th>Receiver Cell ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>211548784</td>
<td>Call</td>
<td>07.04.2014 12:15:11</td>
<td>48987</td>
<td>311283314</td>
<td>73012</td>
</tr>
</tbody>
</table>

Good spatial resolution:

Cell Global Identity – Network Antenna precision

200-500 m in cities
500 – 5000 m in rural areas
Segmenting *de facto* populations:
Calculated travel features:
Home, work... anchors
Route, distance, speed..

Social network:
Number of contacts
Strength of contacts
Time of communication

Data:
- 221 960 mobile phones
  - from one Estonia Mobile Network Operator
  - Male 48,4%
  - Female 51,6%

Period: 12 months
- From September 2012 to August 2013

Comparison: Mann-Whitney U test
Gender differences in mobile phone use:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Male – average</th>
<th>Female – average</th>
<th>Conf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of call partners</td>
<td>11,1</td>
<td>7,6</td>
<td>***</td>
</tr>
<tr>
<td>Number of calls per month</td>
<td>125,0</td>
<td>99,8</td>
<td>***</td>
</tr>
</tbody>
</table>

Gender differences in spatial mobility:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Male – average</th>
<th>Female – average</th>
<th>Conf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance between home and work anchor km</td>
<td>10,9</td>
<td>8,2</td>
<td>***</td>
</tr>
<tr>
<td>Area covered by visits (Convexhull)</td>
<td>19 262,3</td>
<td>15 144,0</td>
<td>***</td>
</tr>
</tbody>
</table>
### International travel:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Male – average</th>
<th>Female – average</th>
<th>Conf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of trips to foreign country</td>
<td>6,7</td>
<td>3,8</td>
<td>***</td>
</tr>
<tr>
<td>Days spent in foreign country</td>
<td>38,8</td>
<td>21,5</td>
<td>***</td>
</tr>
</tbody>
</table>

**Discussion**
Comparing Estonian gender aspects to other countries

Similarities

Mobility and spatial activities are more common to men than to women, in both Estonia and in Western countries.

Men drive more often by car, women everywhere use more public transportation, bicycles and walk more often.

Men and women have comparably similar timing both in leaving the house in the morning for work and in leaving work in the evening.

Comparing Estonian gender aspects to other countries

Dissimilarities

Gender differences can be seen in the location of workplaces. In studies from the USA, suburban women do not often work in the centre of town, as in the case of Tallinn.

In Estonia men make an average of 3.4, and women an average of 2.7 trips, in the USA reveal that men make 3.4 trips, full-time working women 4.0 trips per day.
Silm, S. & Ahas, R. 2014. The temporal variation of ethnic segregation in a city: evidence from a mobile phone use dataset, Social Science Research 47: 30-43.

Does the mobility of suburban Estonians correspond to Western European-like gender roles?

The active mobility and work-places in the centre of the city demonstrate similarities to Western Europe: those women actively take part in professional life.
Cotten, et al 2009. Old wine in a new technology, or a different type of digital divide?, New Media and Society 11(7):1163-1186

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Table 2 Bivariate comparisons by gender

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>FULL SAMPLE (N = 976)</th>
<th>MALE (N = 358)</th>
<th>FEMALE (N = 386)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own a mobile phone</td>
<td>60.7%</td>
<td>74.6%</td>
<td>78.8%</td>
<td>***</td>
</tr>
<tr>
<td>Use a mobile phone</td>
<td>76.2%</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Hours of use</td>
<td>1.70</td>
<td>1.82</td>
<td>2.18</td>
<td>***</td>
</tr>
<tr>
<td>Number of features used</td>
<td>4.56</td>
<td>5.24</td>
<td>5.48</td>
<td></td>
</tr>
<tr>
<td>How often do you:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make or receive calls</td>
<td>3.24</td>
<td>3.73</td>
<td>4.05</td>
<td>**</td>
</tr>
<tr>
<td>Use text messaging</td>
<td>2.01</td>
<td>2.24</td>
<td>2.77</td>
<td>***</td>
</tr>
<tr>
<td>Play games</td>
<td>1.90</td>
<td>2.27</td>
<td>2.07</td>
<td></td>
</tr>
<tr>
<td>Take pictures</td>
<td>2.34</td>
<td>2.55</td>
<td>2.98</td>
<td>**</td>
</tr>
<tr>
<td>Listen to music</td>
<td>1.78</td>
<td>2.12</td>
<td>2.16</td>
<td></td>
</tr>
<tr>
<td>Share pictures or video</td>
<td>1.45</td>
<td>1.76</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td>Send or receive email</td>
<td>0.90</td>
<td>1.12</td>
<td>1.10</td>
<td></td>
</tr>
</tbody>
</table>

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Blumenstock, JE, and N Eagle 2012. Divided We Call: Disparities in Access and Use of Mobile Phones in Rwanda, Information Technology and International Development, 8(2), 1-16

**There are significant gender differences in phone use in Rwanda:**
- women talk longer
- women receive more calls than they make
- women receive more international calls than they make

- Men and women have comparably sized networks of contacts...
- The actual difference in total number of calls is small and statistically insignificant
Thank you!

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