Ethnic Differences in Spatial Mobility during Holidays

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Theoretical background

• People’s leisure time travel has gained more attention:
  - the amount of free time has increased
  - recreational possibilities have diversified

• The influence of holidays
  - traffic counts and traffic safety
  - mobile phone data
    - Isaacman et al 2013, Sepp 2010
  - acculturation and integration
    - Eshel & Rosenthal-sokolov 2010
    - Dixon & Durkheim 2003
Theoretical background

- Holiday – refers to nationally, religiously or culturally important event or day.
  - Strong emotional meaning
  - Connected to ethnic identity (Sepp 2010)
  - Less constraints, more individual’s free choice
  - Bigger impact of personal characteristics on choices made about travel
  - Different travel behaviour compared to regular days (Cools et al 2007, Sepp 2010, Isaacman et al 2013)
Theoretical background

• Ethnicity theory
  - Majorities (whites) are visiting parks more often than minorities in the U.S (Cordell 1999)
  - Leisure choices may be influenced by the cultural values (Li et al. 2007)
  - Differences in choices made about leisure time can be partly explained by the different cultural norms, values and traditions (Carr & Williams 1993, Floyd 1999, Peters 2008)
  
  → travel behaviour during holidays can be influenced by ethnic background

• Ethnic segregation – spatial separation between ethnic groups. (Massey et al 2009)

• Individual can experience segregation in several socio-geographical spaces (Wong & Shaw 2011)
Research questions

• The aim of this study is to observe whether there are differences between the spatial behaviour of Russian and Estonian speakers during the holidays.

• Do holidays affect the travel behaviour of Russian and Estonian speakers? How much does it differ from regular time?

• Do holidays affect the segregation rate? How much?

• Is the travel behaviour apparent during the holidays influenced by the ethnic composition of the destinations?
Data, sample and methods
Data and sample

- Passive mobile positioning data
- Random sample of 12500 people living in Tallinn
  - 6250 Estonian-speaking
  - 6250 Russian-speaking
- Time period:

- Criteria for sample:
  - home anchor point for at least 8 months in the same area
  - must have all social characteristics (gender, age, language)
  - age at least 18 years
Data and sample

• Home and work areas from the anchor-point model (Ahas et al 2010)
• Call-activities that were made in home and work areas were removed.
• 2 study areas:
  - Tallinn outside home and working place (25 districts)
  - Other Estonia outside Tallinn (216 municipalities)

• Selection of holidays:
  - all Estonian and Russian public holidays, all Estonian celebration days
  - popular Estonian and Russian holidays
  - ca 50 holidays
Methods

- Dependent variables:
  - number of Estonian and Russian speakers in Tallinn and in other Estonia
  - dissimilarity index for Tallinn and other Estonia

\[
\frac{1}{2} \sum_{i=1}^{N} \left| \frac{r_i}{R} - \frac{e_i}{E} \right|
\]

- Pearson $r$: correlation between the percentage of Russians in districts according to census (2000) and percentage of Russian-speakers in study districts on a certain date outside home and working areas.
Methods

- Predictors:
  - holiday type
    - EST public
    - EST other
    - mixed holiday
    - (ref ordinary day)
  - season
    - spring
    - summer
    - autumn
    - winter (ref)
  - weekend
    - weekend day
    - working day (ref)
Methods

• Statistical tests:
  - non-parametric median’s test
  - Kruskal-Wallis test
  - T-test
  - Tukey’s test
  - Games-Howell test

• Overdispersed Poisson regression analysis

\[ \ln(Y) = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 \]

• General Linear Model (ANOVA)
Results
1. Holidays’ influence on travel behaviour

- median of number of people

**Tallinn**
- holiday 4875
- Russian speakers 2566
- Estonian speakers 2309
- ordinary day 5406

**outside Tallinn**
- holiday 1620
- Estonian speakers 981
- Russian speakers 642
- ordinary day 1446
1. Holidays’ influence on travel behaviour

• Estonian public holidays (ref. ordinary days):
  - Tallinn
    - on average 0.65 times less Estonian speakers
    - 0.76 times less Russian speakers
  - outside Tallinn
    - on average 1.71 times more Estonian speakers
    - 1.32 times more Russian speakers.

• Mixed holidays (ref ordinary days):
  - Tallinn
    - on average 0.90 times less Estonian speakers
    - 0.96 times less Russian speakers in Tallinn.
  - outside Tallinn
    - 1.34 times more Estonian speakers
2. Holiday’s influence on segregation rate

- mean ID value
  - **Tallinn**
    - holidays 0.21
    - ordinary days 0.20
  - **outside Tallinn**
    - holidays 0.41
    - ordinary days 0.37
2. Holiday’s influence on segregation rate

<table>
<thead>
<tr>
<th>Holiday</th>
<th>Type</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Year’s Day (01.01)</td>
<td>Mixed holiday</td>
<td>0.27</td>
<td>0.25</td>
<td>0.28</td>
</tr>
<tr>
<td>Estonian Independence Day (24.02)</td>
<td>EST public</td>
<td>0.24</td>
<td>0.22</td>
<td>0.26</td>
</tr>
<tr>
<td>Christmas Day (25.12)</td>
<td>EST public</td>
<td>0.24</td>
<td>0.22</td>
<td>0.26</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
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<td>EST public</td>
<td>0.24</td>
<td>0.22</td>
<td>0.26</td>
</tr>
<tr>
<td>Boxing Day (26.12)</td>
<td>EST public</td>
<td>0.52</td>
<td>0.49</td>
<td>0.56</td>
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<tr>
<td>Midsummer Day (24.06)</td>
<td>EST public</td>
<td>0.50</td>
<td>0.49</td>
<td>0.52</td>
</tr>
</tbody>
</table>
3. Influence of the destination’s ethnic composition

- **Pearson \( r \)**
  - **Tallinn**
    - holidays 0.76
    - ordinary days 0.78
    - during RUS (0.76) and EST (0.73) public holidays \( r \) is significantly **smaller** compared to ordinary days
  - **outside Tallinn**
    - holidays 0.48
    - ordinary days 0.43
    - during EST public (0.61) and mixed holidays (0.54) \( r \) is significantly **higher** compared to ordinary days
2. Holidays’ influence on spatial mobility
Midsummer Day (reference: week before)
2. Holidays’ influence on spatial mobility
The Christmas (reference: week before)
Conclusions

• During holidays the spatial behaviour of Estonian and Russian speakers is different compared to ordinary days.
• Estonian public and mixed holidays have the greatest effect on travel behaviour, whereas Russian and Estonian other holidays do not.
• During holidays the segregation rate is higher, especially outside Tallinn.
• The biggest differences between Estonian and Russian speakers’ distribution - in Tallinn emerged during New Year’s day, Independence Day and Christmas.
  - outside of Tallinn emerged during Christmas and Midsummer Day.
• During some holidays Estonian speakers use space more widely than Russian speakers.
• Destination’s ethnic composition influences the movements made during holidays.
Thank you for your attention!

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