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Master thesis in human geography

**Ethnic segregation in out-of-home non-employment activity
locations during public and national holidays: a study with mobile
phone data**

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Table of contents

Introduction	3
1. Theoretical background	5
1.1 Ethnic segregation and its causes	5
1.2 Different concepts of holidays	7
1.2.1 Spatio-temporal approach: activity spaces and holidays	7
1.2.2 Cultural approach: ethnicity and holidays	8
1.3 Ethnic segregation in different parts of activity space	9
1.4 Ethnic groups and segregation in Estonia	11
2. Data and methods	14
2.1 Mobile positioning data and selection of holidays	14
2.2 Methods	17
3. Results	19
3.1 The location of people in Tallinn and Estonia outside Tallinn	19
3.2 Ethnic differences in spatial distribution	21
3.3 The influence of destination's ethnic composition	24
3.4 Summary of results	24
4. Discussion	26
4.1 Explaining ethnic differences during holidays	26
4.2 Methodological issues	30
Conclusions	32
Kokkuvõte	34
Acknowledgments	36
References	37

Introduction

Ethnic segregation is a complex socio-geographical process that significantly affects different domains of the society and individual's life. Spatial segregation is traditionally defined as a process through which socially defined groups become spatially separated (Massey et al 2009). In order to get a better understanding of ethnic segregation process and its outcomes, it is necessary to evaluate the process in various dimensions (Massey & Denton 1988), spaces (Wong & Shaw 2011) and time (Silm & Ahas 2014b). While residential and workplace segregation has been the major focus of several segregation studies, little is known about leisure segregation that has been in the background due to lack of appropriate data. Leisure segregation can be more dynamic and it can be the outcome of different motives, actors and structures when compared to long-term changes in residential space. This master thesis concentrates therefore on ethnic segregation in leisure spaces during certain time-period – holidays.

There are two approaches how holidays can be conceptualized. From *time-use* perspective holidays can be defined as a time for escaping from the routine or a time that is „free“ (Gram 2006). Holidays refer to nationally, religiously or culturally important day and they are usually opposed to everyday routine, generally involving leisure (Urry 1996). From *cultural* perspective holidays can be considered as important means how to build up or sustain collective and national identity (Zhu 2012). Their number, functions, traditions and characteristics accord to the needs of social system and they can change throughout time (Frolova 2013). In an era of ever-growing migration, migrants' cultural traditions that are being followed also in the host society can however differ from the majority's cultural practises. In that sense, celebration of holidays can be very important part of acculturation process and it is also an issue for integration policies.

In this study holidays are viewed both from time-use and cultural perspective. On one hand holidays provide people with free time to undertake certain activities that depend on their motivations and socio-economic background; on the other hand holidays tend to be routine in the sense of culturally “inherited” traditions and rituals. It means that not always the activity choices are freely chosen by an individual but are often derived from the cultural or religious affiliation. Since holidays are related to leisure-time and its activity places, the spatial location and movements of different ethnic groups during that time is the reflection of the influence of various causal factors. Ethnic segregation evident on holidays can differ from the ordinary leisure-time segregation due to different motivations and contribution of structural factors. Therefore this topic adds a new perspective and contributes to a better understanding of the leisure-time segregation that is becoming an interest for segregation scholars.

Until now the information about the role of holidays on people's spatial behaviour is very limited. The effects of holidays have been concerned in transportation studies that outline its influences on human travel behaviour (Cools et al 2007, Cools et al 2009, Cools et al 2010, Isaacman et al 2011, Sepp 2010) and traffic safety (Anowar et al 2013). Holidays affect the demand and the supply for activities, the distribution of passengers and goods; they can also influence infrastructures and their management systems (Cools et al 2007, Cools et al 2009,

Cools et al 2010). During holidays people conduct different activities and travel further distances than on everyday routine (Cools et al 2007, Sepp 2010, Isaacman et al 2011). However, time-use and transportation studies tend to deliberately avoid the inclusion of holidays in the study periods therefore the knowledge about holiday effects on spatial behaviour is rather limited. The effect of particular holidays like Thanksgiving Day (Wallendorf & Arnould 1991), Valentine's Day (Close & Zinkhan 2009), Labor Day (Ngai 2003) and Christmas (Fischer & Arnold 1990) on consumption behaviour has also been studied. In the sense of ethnic differences and segregation holidays have got very little attention in academic literature.

Therefore, the objective of this paper is to explore the effect of different holidays on Estonians and Russian-speaking minority's out-of-home non-employment activity locations, including also leisure-time activities undertaken outside home area. The topic is studied in Estonia using mobile telephone usage data with 12500 respondents and a study period encompassing the years 2007 to 2010. Estonia is a small country with a total population of 1.3 million and with a clearly distinguishable Russian ethnic minority. Research questions are as follows:

- 1) How does the location of people change in- and outside their home-city during holidays?
- 2) How do holidays affect the spatial distribution of ethnic groups?
- 3) Does the destination's ethnic composition affect the activity locations during holidays?

This thesis is divided into four parts. In the first part compact overview about the causes and patterns of ethnic segregation in different parts of human's activity space is given. Also, two approaches how to define holidays is outlined. In the second part an overview about the data, included holidays and used methods is provided. Third part outlines the results according to the research questions and in the discussion part possible explanations derived from the theory are given for the results. It is noteworthy that this master thesis is intentionally rather compact due to further publishing plans and accompanying limits for the length.

1. Theoretical background

1.1 Ethnic segregation and its causes

The circumstances, where and how different ethnic groups live, move or interact with each other, have led to a wide range of ethnic segregation studies. Ethnic segregation is a geographical process through which ethnic groups become spatially separated in different parts of human activity space. It means that members of certain ethnic groups tend to live (e.g. Clark 2002, Charles 2003, Johnston et al 2007b, Musterd & van Kempen 2009), work (e.g. Ellis et al 2004), or spend free time (e.g. Dixon & Durrheim 2003) with members of their own group.

The causes for segregation vary in different parts of human activity space. In general the reasons can be divided into four: discrimination, disadvantage, preferences and social networks (Allen & Turner 2011, Wang et al 2012). First, host society's prejudices and discriminatory practises towards minorities can restrict their access to residence locations, job opportunities and free time activity locations (Johnston et al 2007a). Minorities' spatial separation from the majority can be also intentional defensive reaction against discrimination. (Musterd & van Kempen 2009, Peach 1996). Discrimination in leisure-spaces results in undertaking activities in ethnically homogeneous groups as well as visiting minorities' own well-defined social spaces (Stodolska 2007). Being discriminated can result in lower socio-economic position and disadvantaged position in society.

Disadvantage or marginality effect states that social structural barriers like lower socio-economic status of minorities in terms of education, income, occupation and employment limits minorities' opportunities (Allen & Turner 2011, Johnson et al 2001) in different parts of person's activity space. Differences in income and wealth can restrict access to housing market and leisure-time facilities. Household income (Musterd & van Kempen 2009), cost of recreation activities (Wasburne 1978 cit Stodolska 1998), access to transport and information (Stodolska 1998, Kamruzzaman & Hine 2012) can limit minorities' activity locations and social experience, which can lead to residential and leisure-time segregation. Lower education and discriminatory practises, also living in segregated neighbourhoods can influence workplace segregation (Strömngren et al 2011). During holidays, being in a disadvantaged position and having less economical opportunities can affect the minorities' chances for making travels and taking part in free-time activities or different holiday celebrations.

Preferences represent more ethno-cultural approach, according to which individual's choices are often affected by ethnic background. It is often opposed to marginality and discrimination approach that stresses the influence of structural constraints. Preferences are influenced on one hand by the homophily principle – people prefer to spend free-time (Stodolska 2007), communicate (McPherson et al 2001) or live with others of similar background (Allan & Turner 2011). This approach stresses the element of choice (Musterd & van Kempen 2009) and the process itself is sometimes referred as “self-segregation” (White et al 1993) or “ethnic enclosure” (Stodolska 2007). During national holidays individual's preference to spend time among own group can be very evident, because then it is possible to strengthen community-

feeling and the sense of belonging to a certain group (Fox 2006). On the other hand, according to ethnicity thesis, ethnic background often shapes the activities of minorities due to cultural values, norms and traditions that result in residential segregation (Musterd & van Kempen 2009) and different recreation behaviour (Floyd 1999). For example, Aizlewood et al (2006) found that those who were religious had the smallest participation rate in recreation activities. Activities undertaken on holidays are also often influenced by ethno-cultural and religious traditions. Identity thesis indicates that different activities, especially leisure-time choices, can enhance the preservation of ethnic identity (Karlis & Dawson 1990). It means that ethnic minorities might avoid 'mainstream' activities (Aizlewood et al 2006), such as celebrating majority's holidays (Fox 2006) in order to keep their own identity and heritage.

Social networks are mediums for information that can form a basis for residential (White et al 1993), work (van Kempen & Özüekren 1998) or leisure time ethnic segregation (Silm & Ahas 2014a). In the initial stages of immigration, social networks can lessen the culture shock of immigrants. Nevertheless, due to cultural proximity, accessibility to necessary information and socio-economic benefits, minorities choose to live near others of the same ethnic group also after the initial reception of the host country (White et al 1993). Besides the benefits, relatively "monocultural" social networks can, however, limit minorities' social worlds in terms of "information what they receive, attitudes they form and interactions they experience" (McPherson et al 2001). The effect of social networks is especially evident in leisure time activities, because the notion of leisure is associated with interactions with friends and family (Schlich et al 2007, Carr & Williams 1993). Social link between people can trigger activities and travel between them (Carrasco & Miller 2006), so social networks are often reflected in the travel behaviour and longer travel distances (Carrasco & Miller 2009, Sheller & Urry 2006). Social networks have a very big impact on people's movements also during holidays, because at that time it is possible to conduct different activities and rituals in order to sustain and express people's ethnicity or nationality, reunite with the family (Wallendorf & Arnould 1991, Sepp 2010) and visit friends that are important to strengthen the community-feeling (Close & Zikhan 2009). Socialization occurring on holidays can have a positive impact on maintaining social contacts and it enables easier „social matching“ on ordinary workdays and weekends (Merz & Osberg 2006).

The effect of causal factors can vary in different socio-geographical spaces and are often interrelated (Johnson et al 2001). For example, restrictions to work or education (discrimination, marginality) can affect recreation opportunities and residence locations. Residential neighbourhood can in turn affect the composition of social networks (Verbrugge 1983, McPherson et al 2001) and the degree of disadvantage of out-home activity locations (Krivo et al 2013). Studies supporting marginality effect state, that socio-economic background influences recreation choices more than the ethno-cultural minority status (Peters 2008, Aizlewood et al 2006). In contrast, ethnicity based hypotheses state that through leisure-time activities ethnic groups can maintain and express their ethnic boundaries, preferences and identity (Floyd 1999, Allison & Ceiger 1993, Karlis & Dawson 1990) or contrast themselves from other groups (Wasburne & Wall 1980). Minorities' leisure time

activities are often also more family-centred what indicates the importance of social networks (Peters 2008, Stodolska 2007) and cultural values.

1.2 Different concepts of holidays

1.2.1 Spatio-temporal approach: activity spaces and holidays

All human activities have a measurable spatial-temporal dimension (Hägerstrand 1970). This is connected to concept of activity space, which is traditionally defined as „the subset of all urban location with which the individual has direct contact as the result of day-to-day activities” (Horton and Reynolds 1971, p 37). In more general level, activity space combines spatial, temporal and cognitive dimensions of activities, along which differences between individuals can occur (Wang et al 2012).

The focus of activity space-based studies has been generally on its spatial dimension. According to Golledge & Stimson (1997) individual’s activity space consists of different spatial locations where person conducts his/her daily activities. Person’s activity space can be divided into three domains such as residential, work-place and leisure-time space which all represent the spaces where ethnic segregation can occur. Temporal dimension of activity space is, however, rather obscure.

Time that is used for different activities can be divided into four groups: work-time, household time, personal time and free time (Robinson & Godbey 1997). Since holidays have gained relatively little attention in time-use studies, there is a lack of definition of this time period. Nevertheless, because holidays often represent free days, it can be considered as free-time. Free time consists of leisure (socializing, culture, hobbies etc) and “semi-leisure” (organizational activities, religion etc) activities that are to a more or less extent chosen by individuals (Robinson & Godbey 1997). How people are using time for different activities depend on several space-time constraints (Hägerstrand 1970, Thrift 1977), individual preferences, possibilities and various structural factors like weekday, season, climatic conditions and type of day (normal vs holiday) (Cools et al 2007). Obligatory (work, school) and household maintenance activities depend more on socio-structural constraints and thus have a recognizable daily and weekly pattern (Golledge & Stimson 1997, Järv 2014). Activities that are undertaken outside residence and workplace (i.e. out-of-home non-employment activities) during free time have a higher temporal variation (Schlich et al 2007). Activities occurring on holidays can, thus, differ from everyday routine (Gram 2006) and from everyday leisure activities (e.g. going to gym). Free days that often come along with holidays, give people opportunities to travel longer distances, reunite with the family (Wallendorf & Arnould 1991) and friends or to perform different cultural or religious activities. The irregular temporal nature of holidays and accompanying activities require longer study periods.

Wong & Shaw (2011) have stated that activity space concept lacks temporal dimension. Although the definition provided by Golledge & Stimson (1997) refers to daily spaces, it has

also been used for longer time periods such as weeks (Schönfelder 2003) or months (Järv et al 2014). Moreover, it has been applied also to non-routine activities and corresponding time-periods, such as celebrating Christmas (e.g. Sepp 2010). During holidays individual's activity space may be wider when compared to ordinary time due to presence of free days when the travel distance is usually longer and people conduct different activities (Cools et al 2007). The type of holiday is also important: even though some holidays are working days, the emotional and cultural meaning can still trigger different activities and travel behaviour when compared with ordinary days. This refers to cultural property of holidays.

1.2.2 Cultural approach: ethnicity and holidays

From a cultural perspective, holidays are closely related to ethnicity. Ethnicity is a notion of group's unity and a manifestation of human collectivity (Sasidharan 2002) that is based on language, religion, culture, appearance, ancestry or geographic origin (Nagel 1994). Two basic components of ethnicity are *identity* and *culture* (Nagel 1994). *Identity* is formed by designating group membership boundaries, i.e. who is "us" and "them" (Nagel 1994). The creation of ethnic *culture* is related to the historical evolution and practice of particular ethnic elements in everyday life thereby reconstructing and reshaping it (Nagel 1994).

The role of ethnicity is twofold - instrumental, expressive - which is also linked to temporal dimensions. First, *instrumental* function, i.e. regulating everyday life (Gans 1979), occurs mostly on a daily basis. The notion of ethnic belonging is usually taken for granted and there is no need for explicitly expressing it. Ethnic culture can be simultaneously practised through language, art, music, dressing, religion, norms, beliefs, symbols, myths and customs (Nagel 1994, Vihalemm 1999). Second, *expressive* function appears more on a longer time-scale when the sense of belonging to a certain ethnic group must be reinforced and recreated. That is the role of holidays that can be considered as instruments for producing national, organizational or group awareness (Fox 2006), which aim at shaping public memory and promoting national unity and identity (Zhu 2012). Therefore, holidays are important time for expressing national (Fox 2006) as well as ethnic belonging. In addition, festive practices occurring on holidays are laden with cultural meanings and they contribute to sustaining cultural peculiarities (Fischer & Arnold 1990).

However, the role of ethnicity for migrants and minorities is different compared to ethnic majority. After immigration the ties to original ethnicity are usually getting weaker (Gordon 1964) and the instrumental function (regulating everyday life) of ethnicity change to more expressive (stating their ethnic identity) (Gans 1979). It also means that practising ethnic identity and culture becomes more of a leisure-time activity (Gans 1979, Floyd 1998) because people have more free choice and they experience fewer constraints during that time (Kelly 1987 cit Floyd 1999). Leisure-time choices can, thus, be an important part of culture (re)creation and identity assertion for ethnic minorities (Floyd 1998).

National holiday celebrations play an important role in connecting migrants' diaspora with the original country (Scully 2012). According to "symbolic ethnicity" concept (Gans 1994) members of ethnic minorities use particular symbols such as public holidays in order to feel

part of the ethnic group or sustain and express their identity instead of practising particular culture in everyday life. After immigration the holiday traditions are likely to remain, however, the meaning can change through different immigrant generations. For example, St. Patrick's Day parade depicts historically important means of community solidarity for older Irish migrants, while among later generations the meaning of the day is more ambivalent, varying from family celebrations to more individualistic activities (Scully 2012). Celebrating holidays is also an important way for minorities to gain a bigger attention from the public and claim their ethnicity (Seljamaa 2010).

However, celebrating a holiday does not always serve the function of expressing one's culture. For example, in Japan the Christian basis for Christmas holiday is not evident in most of the Japanese consciousness (Kimura & Belk 2005). Globalization, media and commercialisation have been successful in exploiting holidays in order to reinforce consumerism and therefore change the original celebration traditions and invent new rituals (Close & Zinkhan 2006). Thus, many holidays (e.g. Halloween, Christmas and Valentine's Day) are now widely celebrated all over the world, even though there might be no connection to the particular holiday's origin and its traditions.

Given the functions and historical roots, holidays can be divided into two groups: civil or secular and religious holidays (Frolova 2013). Civil holidays are related to national identity and they emphasize the state's authority, while religious can be associated with the events of sacred history (Frolova 2013). Civil holidays can be further divided into public holidays (established by law, non-working days), national celebration/commemorative days (usually established by law, working days) and folk holidays (not established by law, but still important and being celebrated due to cultural reasons).

1.3 Ethnic segregation in different parts of activity space

Activity space approach has been mostly applied for studying the spatial dimension of ethnic segregation. Most of the traditional segregation research has been done considering residence-based segregation, which can be viewed as a special case of activity space-based approach (Wang et al 2012). Literature now clearly states that individuals can experience segregation in other socio-geographical spaces (work, leisure) beyond residential (Kwan 2013, Wong & Shaw 2011, Wang et al 2012, Farber et al 2012, Silm & Ahas 2014a, Toomet et al 2011, Schnell & Benjamini 2001) so the focus of segregation studies should be more wider. Some scholars stress the importance of elaborating all the spatial dimensions of activity spaces at once (e.g. Wong & Shaw 2011). It is, however, a great challenge due to data and methodological issues, which is why most of the studies still focus of particular part of people's activity space.

In terms of ethnic segregation, residential space is the most comprehensively studied part of human's activity space. Ethnic or racial residential segregation can occur or be experienced in different dimensions (Massey and Denton 1988) among which the aspect of evenness is probably one of the most analysed. It refers how differently two ethnic groups are residing

among areal units in a city (Massey & Denton 1988). Place of residence influences social interaction, accessibility to employment, education and other services, thus affecting notably other domains of everyday life (White et al 1993). Studies have concluded that ethnic and racial minorities tend to live in poorer inner-city neighbourhoods, while members of majority most probably reside in affluent metropolitan areas (Massey & Denton 1993, Semyonov & Glikman 2009). In European cities the level of ethnic residential segregation is found to be lower than in USA (Musterd 2005). Some studies have indicated also a new trend – ethnic residential segregation is declining, because minorities are moving to suburbs (Charles 2003), while the gap between rich and poor i.e. socio-economical segregation is increasing (Massey et al 2009). In terms of activity-space approach, home is a place where most daily trips start or end and where many activities are undertaken, making it the most important node in individuals' activity space (Wang et al 2012).

Workplace segregation is highly linked to residential segregation. Finding a job in a neighbourhood with the same ethnic composition is easier due to social networks, better accessibility to information and availability of certain types of employment opportunities (Wang 2010, Åslund & Skans 2010). Thus, combined with gender, ethnic background plays an important role in defining an occupation in labour market (Schrover et al 2007). It has been noted that increasing contacts with natives can further improve immigrant's success in the labour market (Tammaru et al 2010). Workplace ethnic segregation is found to be lower than (Ellis et al 2004, Strömgren et al 2011) or with a similar level (Toomet et al 2011) as residential segregation.

Studies concerning leisure time have focused mostly on ethnic differences in participating in different types of activities, for example visiting national parks and wildland areas (Johnson et al 1998, Floyd 1999), playing golf (Gobster 1998) or visiting church (Dougherty 2003). Researches show that ethnic differences occur in participation rates (Gobster 1998), preferences for activities and their locations (e.g. Zhang & Gobster 1998), attitudes and experiences (Carr & Williams 1993). Researches from North-America and Europe show that racial and ethnic groups are mostly underrepresented in outdoor recreation-leisure venues (Aizlewood et al 2006, Gobster 1998, Washburne 1976 cit Floyd 1999) and they engage in fewer different leisure time activities during free time when compared to native people (Peters 2008). What is more, minorities tend to participate in leisure-time activities in ethnically homogeneous groups in their well-defined social spaces (Stodolska 2007) that depicts the importance of family and social networks.

While residential and work-place segregation can be evaluated using census data, studies considering leisure-time ethnic differences have mainly investigated single activities or used questionnaires due to lack of more comprehensive data. New data-sets and methods give the opportunity to evaluate leisure-time segregation more extensively. For example using mobile positioning data, it is possible to cover leisure-time entirely instead of focusing on single activities (e.g. Toomet et al 2011, Silm & Ahas 2014a, Müürisepp 2013). In addition, long-term data sets with high temporal precision enable to observe spatio-temporal segregation, i.e. how segregation rate changes across weeks, days or even hours (e.g. Silm & Ahas 2014b). This enables also to observe the influence of holidays on ethnic segregation.

There are very few number of studies that focus on the importance of holidays on segregation, leisure-time activities and integration among ethnic groups. There are some examples where holiday celebration criterion is used in measuring integration (e.g. Eshel & Rosenthal-Sokolov 2000, The Study of Integration of Social Groups 2013). The study conducted by Dixon & Durrheim (2003) in South-Africa during Christmas holiday found that even though people from different ethnic background were together on the same beach, there was very little interaction between them, indicating micro-scale segregation. The case study by Fox (2006) showed, that Hungarian students did not take part in the festivities during Romanian public holiday, but many of them participated in the Hungarian commemoration holiday. This finding indicates, that during holidays the ethnic segregation can be higher, and it is caused by national or ethnic awareness and is oriented at avoiding activities that are not the part of particular identity. What is also interesting is that for Hungarians Romanian public holiday did not break their everyday routine and did not draw much attention. It therefore shows that various holidays influence ethnic groups differently, depending on their cultural background.

1.4 Ethnic groups and segregation in Estonia

Estonia is a country that belonged to Soviet Union from 1944 till 1991. Besides Estonians, who is the ethnic majority comprising 67% (census 2000) of overall population, there are over 100 ethnic minorities living in Estonia. The biggest minority is Russians, followed by Ukrainians, Byelorussians and Finns. Due to the legacy of Soviet regime, many immigrants from the former member republics can speak Russian. This language can be considered as the most important unifying aspect and an indicator of ethnic origin for post World War II immigrants in Estonia (Tammaru & Kulu 2003, Vihalemm 2007). Therefore the focus of this study is set on Russian-speaking minority (Russians, Ukrainians and Byelorussians) rather than considering their real ethnic origin.

Estonian society is relatively segregated in terms of the language groups' residence, socio-economic position (Tammaru & Kulu 2003, van Ham & Tammaru 2011) and communication networks that tend to be linguistically separated (Vihalemm 2007). Russian-speaking minority make up ca 30% of the Estonia's population and they reside mostly in Harju and Ida-Viru counties (census 2000, Figure 1). The degree of urbanization among Russian-speakers is very high: ca 90% live in cities. Most of them reside in the capital-city Tallinn (ca 43%, Harju County) and North-Eastern industrial towns (ca 32%, Ida-Viru County), thus they are quite concentrated in space. This pattern is due to Soviet Union's industrialization program during 60's and 70's under which most of the non-Estonian immigrants were settled to urban areas where the major industrial enterprises were located (Tammaru & Kulu 2003).

The residential segregation has been studied mainly in Tallinn where it is the highest when compared to other domains of everyday life (Toomet et al 2011). Russian-speaking minority is dominating in panel housing districts (Kährrik & Tammaru 2010), whereas Estonians prefer more detached housing (Kährrik 2002). Ethnic minorities in Estonia are less likely to move to suburban settlements compared to Estonians (Tammaru et al 2011, Kährrik & Tammaru 2008).

Similarly to residence, workplaces of Estonians and Russian-speakers in Estonia are fairly segregated. Differences in the workspace existed already during Soviet times, when Estonians were occupied mostly in the agricultural and Russians in manufacturing sector (Vöörmann & Helemäe 2003, van Ham & Tammaru 2011). Today, Estonians and Russian-speaking minority still often work in different sectors of economy (white-collar vs blue-collar) (Tammaru & Kulu 2003, van Ham & Tammaru 2011) that is also evident in the spatial distribution of workplaces in Tallinn (Toomet et al 2011, Müürisepp 2013).

Leisure time segregation has been studied in the context of Estonia relatively little. Toomet et al (2011) found that compared to work and residence locations, leisure-time activity places for Estonians and Russian-speakers in Tallinn are less segregated. Silm & Ahas (2014a) indicate that Estonians' and Russian-speakers' activity spaces outside Tallinn are, however, segregated and the latter tend to visit more districts, which are mostly populated by the Russian-speaking minority. It is noteworthy that most of the inter-ethnic contacts between Estonians and Russians are work-related and they take place in the public sphere (Korts 2009). Inter-ethnic contacts in private sphere are not so common (Korts 2009).

In terms of religion, Estonia is one of the less religious countries in the world (Ringvee 2008) with 29% of people with religious affiliation (census 2011); 16% of people living in Estonia claimed to be Russian Orthodox and 10% Lutherans (census 2011). Most of religious Estonians are Lutherans, while Russians, Ukrainians and Byelorussians are mainly Russian Orthodox (census 2011).

Due to different cultural, religious and historical background, there are disparities as well as similarities in the celebrated holidays and their traditions among Estonian and Russian-speaking communities in Estonia. For Estonians Christmas, New Year's Eve and Midsummer Day can be considered as three of the most popular and widely celebrated holidays, which are connected to celebrations with family and friends (e.g. Sepp 2010) and important seasonal changes (Ahas et al 2005). Celebrating Midsummer Day has also gained popularity among Russian-speaking community in Estonia (Seljamaa 2013). Russian-speaking minority's festivities are influenced on a large scale by the Russian and Orthodox roots. In Russia New Year's Holiday is one of the most popular holiday that is usually celebrated in the family-friends circle twice: first time according to European tradition on 31st December and 1st of January, second time according to Old Calendar on 14th of January (Frolova 2013). Many Soviet holidays have been transformed and lost their ideological meaning (Frolova 2013) but are still widely celebrated, for example Victory Day (09.05) and Women's Day (08.03). Similarly to Estonia, holidays with Western origin have also entered Russian cultural landscape, such as Orthodox-proved Valentine's Day and not so favoured Halloween (Frolova 2013). Many folk and church holidays like Maslenitsa and Orthodox Easter are celebrated in Russia as well as in Russian-speaking community in Estonia (e.g. Seljamaa 2010, Mooses 2011).

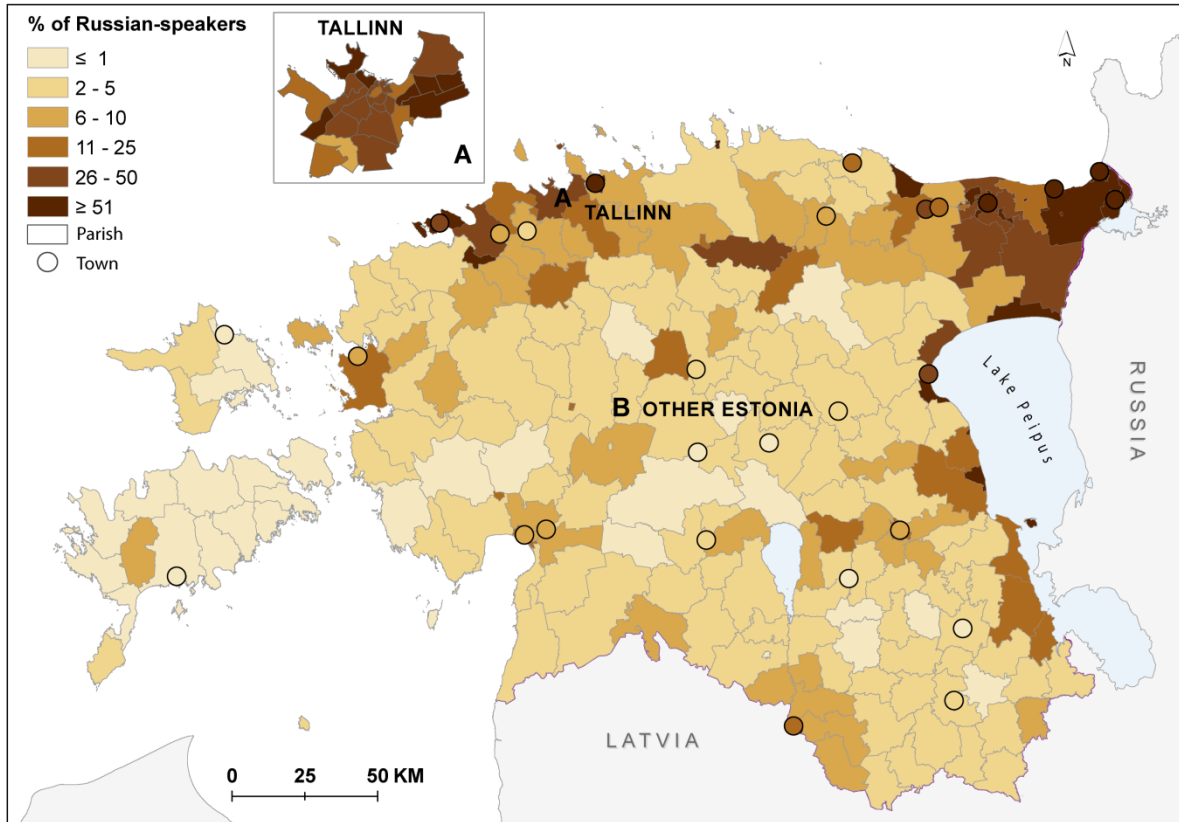


Figure 1. Distribution of the Russian-speaking minority according to census 2000. Study areas: A – Tallinn, B – Estonia outside Tallinn

2. Data and methods

2.1 Mobile positioning data and selection of holidays

The effects of holidays on human spatial mobility have been studied using traffic counts (Cools et al 2007, 2009), mobile positioning data (Isaacman et al 2011, Sepp 2010) and household travel survey (Cools et al 2010). For analysing out-of-home non-employment activity behaviour during holidays, call detail records (CDR) data obtained by passive mobile positioning method (Ahas et al 2008) is used. This data has quite wide implications in several transportation and space-time studies (e.g. Calabrese et al 2010, Isaacman et al 2011). However, the usage of mobile position data in ethnicity studies has yet been quite modest, making it therefore a novel source of information (Toomet et al 2011, Silm & Ahas 2014a, Silm & Ahas 2014b, Blumenstock & Fratamico 2013).

CDRs are automatically stored in the log files of the mobile service provider, which in this study is Estonia's largest mobile operator EMT. The location and timing of outgoing call activities (calls, SMS's) and additional data about the mobile phone user's language preference is used. It is assumed that the language (Estonian, Russian) the phone user prefers for communicating with the mobile service provider represents his ethnic belonging. Anchor points of residence and workplace for each respondent were calculated on the basis of location, timing and regularity of call activities using the anchor points model (Ahas et al 2010). Randomly generated (pseudonymous) IDs ensure the anonymity and they cannot be associated with specific individual or phone number. The use of data in this research conforms to ethical codes of practice and European Union Data Protection Regulations.

The sample consists of 12500 randomly selected Tallinn inhabitants from mobile positioning database, 6250 of them are Estonian and 6250 Russian-speakers. Besides the criteria for residence (Tallinn), people had to be at least 18 years old in order to have the odds to be selected. The time period for the study is four years from January 2007 to December 2010.

According to census (2000) there are 54% of Estonians and 44% of Russian speakers in Tallinn. However, in this sample the division of two language groups is equal in order to make the data comparable outside Tallinn. Gender division in the sample is almost the same compared to census data in Russian subgroup, although among Estonians women are slightly over- and men under-presented in the sample (Table 1). There are some differences in the age groups: elderly and young adults are under-represented, but people aged 30-39 and 40-49 are over-represented in the sample both in Estonian and Russian subgroup.

Table 1. Sample characteristics compared to census (2000) data.

	Sample			Tallinn inhabitants (2000 census)		
	Estonian	Russian	All	Estonian	Russian	All
Gender						
Male	40%	46%	43%	45%	45%	45%
Female	60%	54%	57%	55%	55%	55%
Age						
18-29 ¹	15%	11%	13%	24%	19%	22%
30-39	29%	27%	28%	17%	18%	18%
40-49	24%	26%	25%	16%	23%	19%
50-59	16%	24%	20%	16%	15%	15%
≥60	16%	12%	14%	27%	25%	26%

¹ the age group for the census is 20-29.

There are two spatial units under observation (Figure 1): 1) capital of Estonia – Tallinn – which consists of 25 study districts defined by similar buildings and functions; 2) Estonia excluding Tallinn, which comprises of 216 municipalities that have at least one mobile antenna in their territory. Municipalities that have no antenna were excluded from the analysis.

Holidays were divided based on the country (Estonia, Russia) and type (public, religious, national/folk holidays and celebration days) into five groups (Table 2): 1) Estonian public holidays that are established by law and are days-off in Estonia, 2) Russian public holidays that are established by Russian government and are days-off days in Russia but working days in Estonia, 3) Estonian other holidays: religious, folk holidays and celebration days that are working days in Estonia, 4) Russian other holidays: folk and religious holidays that are working days in Russia and Estonia, 5) international public and national holidays that are celebrated at the same time in Estonia as well as in Russia. Depending on the holiday, it can be day-off as well as working day in Estonia.

Table 2. Holidays that are included in the analysis. * Days-off

1) Estonian public*	2) Russian public*	3) Estonian other	4) Russian other	5) International holidays
<ul style="list-style-type: none"> • Estonian Independence Day 24.02 • Lutheran Easter: Good Friday, Easter Sunday (March/April) • Victory Day 23.06 • Midsummer Day 24.06 • Estonian Reindeer Day 20.08 • Christmas Eve 24.12 • Christmas Day 25.12 • Boxing Day 26.12 	<ul style="list-style-type: none"> • New Year's holiday (2-5.01) • Christmas Day 07.01 • Defender of the Motherland Day 23.02 • Victory Day 09.05 • Russia Day 12.06 • Unity Day 04.11 	<ul style="list-style-type: none"> • The Epiphany 06.01 • Anniversary of Tartu Peace Treaty 02.02 • Native Language Day 14.03 • Shrove Tuesday (February/March) • Quiet Saturday (Lutheran Easter, March/April) • Mother's Day (second Sunday in May) • Estonian Flag Day 04.06 • Day of Commemoration and Mourning 14.06 • European Day of Remembrance for victims of Stalinism and Nazism 23.08 • Wisdom Day 01.09 • Grandparents' Day (second Sunday of September) • Resistance Fighting Day 22.09 • Tribal Day 19.10 • Halloween 31.10 • All Soul's Day 02.11 • Fathers' Day (second Sunday of November) • St Martin's Day 10.11 • St Catherine's Day 15.11 • Day of 	<ul style="list-style-type: none"> • New Year (Julian calendar) 14.01 • Tatiana Day 25.01 • Maslenitsa (week before Easter) • Ortodox Easter: Good Friday, Quiet Saturday, Easter Sunday (March/April) • Cosmonautics Day 12.04 • Radio Day 07.05 • Ivan Kupala 07.07 • Paratroopers' Day 02.08 • National Flag Day 22.08 • October Revolution Day 07.11 	<ul style="list-style-type: none"> • New Year's Day (RUS*, EST*) 01.01 • Labor Day/May Day (RUS*, EST*) 01.05 • Valentine's Day (RUS, EST) 14.02 • Women's Day (RUS*, EST) 08.03 • 2007 and 2010 Lutheran (EST*) and Orthodox Easter (RUS) • 2009 Lutheran Easter Sunday (EST*) and 2009 Cosmonautics Day (RUS) • 2010 Victory Day 09.05 (RUS*) and Mother's Day (EST) • New Year's Eve (EST, RUS) 31.12

		Declaration of Sovereignty 16.11		
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2.2 Methods

Three aspects are considered in this study.

1) First, whether and how holidays affect the people's out-of-home non-employment activity locations across spatial units. Number of Estonians and Russian-speakers in Tallinn and Estonia outside Tallinn is used for measuring that. Number of Estonians and Russian-speakers was calculated based on call activities in Tallinn and Estonia (excl. Tallinn) for each day in the study period. Because the goal was set to examine activities outside home and working places (out-of-home non-employment activities), the call activities made in residence and work areas were excluded.

2) Second, how holidays affect the spatial distribution of Estonians and Russian-speakers. For observing holiday effect on spatial segregation, dissimilarity index (ID) is used. ID has been traditionally implemented for measuring residential evenness that is an extent to which two ethnic groups are distributed differently (Massey & Denton 1988). It has been extensively used in residential segregation studies (e.g. Duncan & Duncan 1955, Massey et al 2009, Peach 1999) and also for measuring temporal variation of ethnic segregation (e.g. Silm & Ahas 2014b). ID is easy to calculate as well as to interpret and it gives comparable information about the level of ethnic segregation across time-scale. In this study ID was calculated for each day in the entire study period and it shows how unevenly Estonians and Russian-speaking minority are spatially distributed on certain spatial level on particular date. Index of dissimilarity is calculated as

$$\frac{1}{2} \sum_{i=1}^N \left| \frac{r_i}{R} - \frac{e_i}{E} \right| \quad (1)$$

where r_i is the number of Russian-speakers and e_i is the number of Estonian-speakers in Tallinn or Estonia (excl. Tallinn) study district i ; R and E are the total Russian-speaking and Estonian population counts of the entire study region (Tallinn, Estonia excl. Tallinn). ID values range from 0 to 1, indicating no segregation (even distribution) to perfect segregation (very uneven distribution), respectively (Wong 2003). Interpretations of the ID values in this study are based on Gale (2013), according to whom values between 0-39 is accepted as "low", 40-49 "moderate", 50-59 "moderately high", 60-69 "high" and values of and above 70 "very high".

3) Third, how the destination's ethnic composition affects Russian-speakers' activity locations during holidays. To see whether Russian-speakers tend to go to municipalities dominated by their own language speakers during holidays Spearman's rho correlation coefficient (ρ) was calculated between the percentage of Russian-speakers living in particular district according to census (2000) and percentage of Russian-speakers in that study district on a certain date outside residence and working areas.

Regression models were further employed in order to analyse the influence of holidays and different holiday types on dependent variables compared to ordinary days (non-holidays). Dependent variables are number of Estonians, number of Russian-speakers, ID and ρ values and the object in the regression models is one day. Predictors are „holiday“ (holiday/normal day; holiday categories/normal day), „season“ (winter, spring, summer, autumn) and „weekend“ (weekend-day/working day). Regression models were constructed using two approaches. Firstly, only one factor – holiday variable – was used in a model. Secondly, other predictors were also added into a model. Separate models were made for holiday variable: first, only holiday/normal day was included; second, models with holiday categories were constructed.

For the case of number of Estonian and Russian-speakers overdispersed Poisson regression analysis was used, because it has been proved to be suitable for analysing count data that do not meet the requirements of OLS regression (Coxe et al 2009, Huang & Cornell 2012). The resulting Poisson model with all the predictors is

$$\ln(Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \varepsilon_i \quad (2)$$

where Y is the number of Estonians or Russian-speakers in Tallinn or Estonia (excl Tallinn) on a certain day, b_0 is the intercept, b_n is the regression coefficient for a particular predictor, X_1 is the season, X_2 is a weekend variable, X_3 is a holiday variable.

For ID and Spearman ρ values general linear model was used

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \varepsilon_i \quad (3)$$

where Y is the value of dissimilarity index or Spearman ρ on a certain day, b_0 is the intercept, b_n is the regression coefficient for a particular predictor, X_1 is the season, X_2 is a weekend variable, X_3 is a holiday variable. All the models turned out to be statistically significant.

In addition, how the values of all dependent variables changed on each particular holiday was also under observation. A day one week earlier was used as a comparison for most of the holidays. However, due to study period issues, for holidays that occur on 1st to 7th of January, the comparison time is day one week later.

For the number of people, CDR data was aggregated in a way that the amount of people who were present in Tallinn or Estonia (excl. Tallinn) on a particular date was summed. A person who made at least one call activity on a certain date while staying in Tallinn or outside Tallinn was counted as being present. For the case of dissimilarity index and Spearman's ρ , the number of people was summed according to Tallinn study districts and Estonia's municipalities. The data aggregation minimizes the influence of calling habits on spatial mobility indicators, so the number of call activities made by person does not influence the overall number of people in a spatial unit. On average Estonian-speakers made 4.3 and Russian-speakers 4.4 call activities per day ($p > 0.05$) which indicates similar calling habits.

3. Results

3.1 The location of people in Tallinn and Estonia outside Tallinn

Study results show that during holidays people's out-of-home non-employment activity locations are different compared to ordinary workdays or weekends. In Tallinn there are overall less and in Estonia (excl. Tallinn) more people during holidays when compared to ordinary days. It means that people leave the capital-city during holidays and this trend is similar across both language groups. However, more Estonians leave the capital during holidays than Russian-speakers. For example, in Tallinn during holidays there are on average 191 Russian-speakers more than Estonians, while on ordinary days the average difference is 111 people (Table 3). Outside the capital, the number of Estonian-speakers exceeds the Russians' by 359 on holidays and on ordinary days by 255 people.

Various holiday types influence out-of-home non-employment activities' locations differently. Estonian public holiday is the most influential holiday type due to the accompanying free days when more time is available to perform non-work related activities outside home area. During that time many Estonians and Russian-speakers leave the capital-city, although the number of leaving Estonians is bigger. During holidays there are 36% less Estonian and 24% less Russian-speakers than on normal days in Tallinn (Table 4). Outside Tallinn during Estonian public holidays the number of Estonians increase 177% and for Russian-speakers 133% times when compared with ordinary days.

International holiday that include temporally overlapping Estonian and Russian holidays was also important factor that affects leaving the home-city. However, the differences in the number of people were smaller when compared to Estonian public holidays. For the case of Estonians there are 12% less people during that time in Tallinn outside their home and working areas and 21% more people in Estonia (excl Tallinn) (Table 4). However, for the Russian-speakers the number of people in Tallinn does not significantly differ from ordinary days when all variables are included. In Estonia outside Tallinn the average number of Russian-speakers is actually lower when compared to ordinary days, however, the model with all variables predicts the number to be significantly higher. The result why the average number of Russian-speakers in Estonia outside Tallinn is smaller during international holidays can be partly explained by the composition of this holiday category (Table 2). Most holidays are short and many of them are not free days, which explains why the overall number of people that leave the capital is smaller than on Estonian public holidays. The difference in between the number of Estonians and Russian-speakers can originate from Easter (Lutheran and Orthodox) holiday. During this religious holiday Russians' activities are much related to the religious places (like church and cemeteries), while Estonians' traditions are more family-centred. It can be one of the reasons why Russian-speakers are more likely to stay in the home-city, visit sacred places and conduct church-related rituals, when many Estonians leave the capital.

In the models where all predictors are included, Estonian public and international holidays remain significantly different from the ordinary days. The number of people during Russian

public, Estonian and Russian other holidays are, however, similar to ordinary days in Tallinn and Estonia outside Tallinn.

Table 3. Average number of Estonians and Russian-speakers, average value of dissimilarity index and Spearman rho correlation coefficient across holidays.

	<i>Number of EST</i>		<i>Number of RUS</i>		<i>ID index</i>		<i>Correlation</i>	
	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>
Holiday vs normal day								
<i>Holiday</i>	2325	1079	2516	720	0.214	0.406	0.674	0.431
<i>Normal day</i>	2570	966	2681	711	0.205	0.373	0.683	0.404
Types of holidays								
<i>Estonian public</i>	1647	1717	2027	946	0.227	0.475	0.676	0.503
<i>Russian public</i>	2515	789	2642	596	0.213	0.400	0.659	0.402
<i>Estonian other</i>	2456	924	2580	675	0.210	0.374	0.674	0.416
<i>Russian other</i>	2475	1064	2630	753	0.207	0.392	0.683	0.418
<i>International</i>	2264	1171	2557	699	0.224	0.439	0.677	0.445

Table 4. Differences in out-of-home non-employment activities' location indicators among language groups. Only holiday variable is presented, reference group is ordinary day.

Variable	Regression model (Poisson)¹				Regression model (GLM)²			
	<i>Number of EST</i>		<i>Number of RUS</i>		<i>ID index</i>		<i>Correlation</i>	
	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>	<u>Tallinn</u>	<u>Estonia</u>
Holiday vs normal day	Regression models consisting of only holiday variable							
<i>Holiday</i>	0.905 ***	1.116 ***	0.939 ***	1.013	0.009 ***	0.033 ***	-0.009 ***	0.027 ***
	Regression models with all variables							
<i>Holiday</i>	0.932 ***	1.143 ***	0.961 ***	1.052 ***	0.006 ***	0.024 ***	-0.018 ***	0.045 ***
Types of holidays	Regression models consisting of only holiday variable							
<i>Estonian public</i>	0.641 ***	1.777 ***	0.756 ***	1.332 ***	0.022 ***	0.102 ***	-0.007	0.099 ***
<i>Russian public</i>	0.979	0.817 **	0.986	0.838 ***	0.008 ***	0.027 ***	-0.024 ***	-0.002
<i>Estonian other</i>	0.955 **	0.956	0.962 **	0.950	0.005 ***	0.001	-0.009	0.012
<i>Russian other</i>	0.963	1.102	0.981	1.060	0.002	0.019 **	0.000	0.014
<i>International</i>	0.881 ***	1.212 **	0.954 **	0.983	0.019 ***	0.066 ***	-0.006	0.041 ***
	Regression models with all variables							
<i>Estonian public</i>	0.644 ***	1.733 ***	0.759 ***	1.335 ***	0.022 ***	0.092 ***	-0.003	0.092 ***
<i>Russian public</i>	0.981	0.977	0.997	1.007	0.003	0.018 ***	-0.021 ***	0.012
<i>Estonian other</i>	0.998	0.945	0.996	0.947	0.002	-0.004	-0.010	0.007

<i>Russian other</i>	1.011	1.010	1.011	1.011	-0.001	0.006	0.004	0.001
<i>International</i>	0.905 ***	1.413 ***	0.973	1.136 ***	0.013 ***	0.057 ***	-0.001	0.056 ***

Significance: ***1%, **5%

1 – Difference estimation is $\text{Exp}(B)$ and reference value is 1.

2 – Difference estimation is B and reference value is 0.

When looking all holidays separately the biggest change in the amount of people outside home and working areas in Tallinn compared to the time week before is on Midsummer Day (24.06), when there are 56% less Estonians and 28% less Russian-speakers in Tallinn. Midsummer Day is followed by Christmas Day (25.12) with a 56% and 27% decrease in the number of Estonians and Russian-speakers respectively. Because these holidays are days-off, a lot of people tend to leave the capital-city. However, on New Year's Eve (31.12) the amount of people outside home and working areas compared to the week before is the highest both for Estonian (29%) and Russian-speakers (23%). The amount of Estonians increase also during Victory Day (09.05) by 18% and Mother's Day (every second Sunday in May) by 16%. There are more Russian-speakers during Women's Day (08.03, 19%) and Victory Day (09.05, 12%). It indicates that in Tallinn different holidays have a particular influence on the number of people.

Outside Tallinn the biggest increase in the number of Estonian-speakers is during New Year's Day (01.01, 170%), Christmas Eve (24.12, 169%), Christmas Day (25.12, 132%), Victory Day (23.06, 126%) and Midsummer Day (24.06, 96%). For the case of Russian-speakers, the biggest change compared to ordinary days is on Victory Day (23.06, 111%), Midsummer Day (24.06, 77%), New Year's Day (01.01, 31%), May Day (01.05, 31%) and Christmas Day (25.12, 30%).

3.2 Ethnic differences in spatial distribution

During holidays Russian-speaking minority and Estonians are distributed more unevenly than on ordinary days. The uneven distribution, i.e. average dissimilarity index, during holidays is bigger outside the capital-city, indicating moderate level of segregation (ID=0.406), than in Tallinn, where it is low (0.214) (Table 3). However, the differences from ordinary days are small but statistically significant ($p < 0.01$) (Table 4). The ID in Estonia (excl Tallinn) is by 0.033 higher than on ordinary days (ID=0.373) and in Tallinn by 0.009 higher than on normal time (ID=0.205).

Estonians and Russian-speakers are most unevenly distributed during Estonian public and international holidays both in Tallinn and outside the capital. In Estonia (excl Tallinn) during Estonian public holidays the ID index is 0.475 (difference from ordinary days 0.102) and on international holidays the value of ID is 0.439 (difference 0.066) (Tables 3 and 4). In addition, when all variables are included, also Russian public holidays (ID=0.400) remain statistically significant with a 0.027 difference from ordinary days. These ID values indicate moderate

level of segregation. In Tallinn on Estonian public (ID=0.227) and international holidays (ID=0.224) the level of segregation is low and the difference from ordinary days are small (yet significant).

In Tallinn Estonians and Russian-speakers are the most unevenly distributed during New Year's Day (01.01, ID=0.27, difference 0.06). In Estonia (excl. Tallinn) segregation is the highest during Christmas Day (25.12, ID=0.53, difference 0.18) and Boxing Day (26.12, ID=0.52, difference 0.16). Segregation is higher than usual time also on Victory Day (23.06) in Tallinn and Midsummer Day (24.06) in Tallinn and Estonia outside Tallinn. On Victory Day and Midsummer Day the average ID values are 0.50 for Estonia; On Midsummer Day 0.23 in Tallinn. In addition, in the capital-city on Estonian Independence Day (24.02, ID=0.24, difference 0.03) and Christmas Day (ID=0.24, difference 0.04) bigger differences from ordinary days occur as well.

Given the above, the biggest differences in the spatial distribution of Estonians and Russian-speakers occur during Midsummer holiday (23.06-24.06) and Christmas (24.12-26.12) (Figure 2). More Estonian-speakers can be found during that time outside their home-city Tallinn compared to ordinary days and they are located widely all over Estonia. However, while more Russian-speakers are outside Tallinn as well (compared to ordinary days) they are mostly located near the capital-city, North-East Estonia and Lake Peipus, where the percentage of Russian inhabitants is higher. When comparing Christmas and Midsummer, it is evident, that during Midsummer holiday the average change in the number of Russian-speaking people is higher in more municipalities (Figure 2 – C) than on Christmas (Figure 2 – A). It shows that during Midsummer holiday more Russian-speakers leave the capital-city and their out-of-home non-employment activities are more widely distributed. It can indicate that Russian-speakers are probably celebrating this Estonian public holiday. During Christmas the average change of Russian-speakers in different municipalities is, however, smaller which means that during that time fewer people undertake trips to other municipalities.

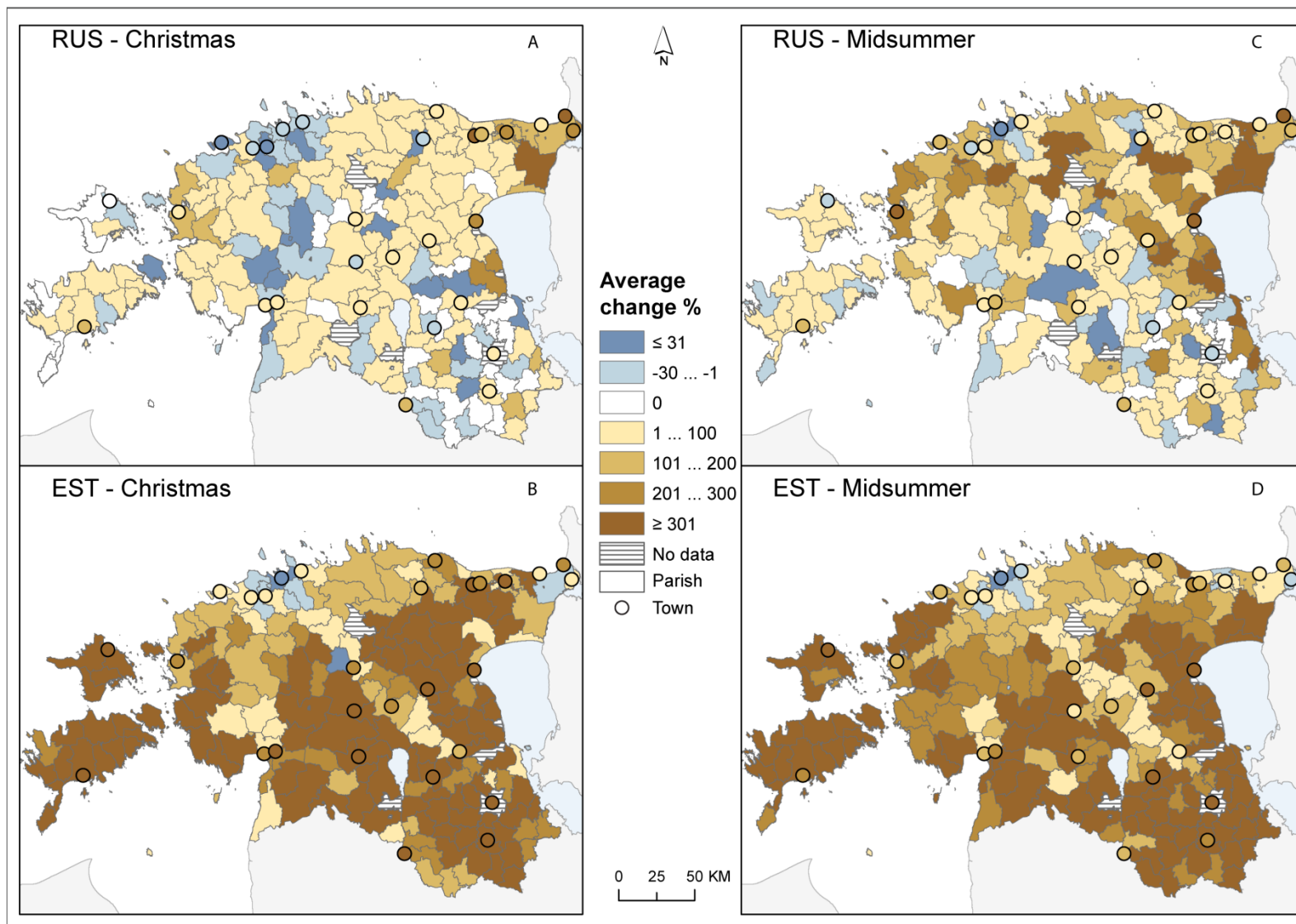


Figure 2. Four year average change in number of Estonians (EST) and Russian-speakers (RUS) during Christmas (24.12-26.12; A-B) and Midsummer holiday (23.06-24.06; C-D). The average change is calculated from time week before.

3.3 The influence of destination's ethnic composition

The influence of the destination's ethnic composition is controversial when comparing Tallinn and Estonia. During holidays in Tallinn Russian-speakers are visiting districts outside their home and working areas where many Russian-speakers are living less ($\rho=0.674$) than on ordinary days ($\rho=0.683$) (Table 3). The difference is small in number (0.009) but statistically significant (Table 4). Outside Tallinn the pattern is opposite: during holidays Russian-speakers are visiting more Russian-dominated districts ($\rho=0.431$) than on ordinary days ($\rho=0.404$). The difference is 0.027 and remains significant when all the predictors are included (Table 4).

The relationship between where Russian-speakers are living and where Russian-speakers are located is different among various holiday types in Tallinn and in Estonia. In Tallinn during Russian public ($\rho=0.659$) holidays more Russian-speakers are located outside Russian-speakers' home areas compared with ordinary days ($\rho=0.683$). The meeting/celebration places can be located near the city centre, where fewer Russian-speakers are living thus the correlation values are therefore smaller. It also means that during this time the possibility to encounter Estonians is higher. However, in Estonia (excl. Tallinn) Russian-speakers tend to go to municipalities where the proportion of Russian speaking inhabitants is higher during Estonian public ($\rho=0.503$) and international holidays ($\rho=0.445$) when compared to ordinary days. This finding indicates the role of free days: during non-working days there is a bigger possibility to travel longer distances and visit people of social networks.

When looking at holidays separately, the correlation between where Russian-speakers are living and where Russian-speakers go compared to week before is in Tallinn the highest during Russian holidays: Russia Day (12.06), Tatiana Day (25.01) and Orthodox Easter. It is the lowest during Midsummer Day (24.06), Christmas Day (24.12) and European Day of Remembrance for victims of Stalinism and Nazism (23.08). In Estonia Russian-speakers tend to go to municipalities of their own language the most (compared to week before) during Midsummer Day (24.06), Victory Day (23.06) and Christmas Day (24.12).

3.4 Summary of results

To get a more comprehensive overview how holidays are affecting ethnic segregation it is important to view all three analysed aspects together. This study shows that during holidays ethnic segregation is higher both in Tallinn and in Estonia outside Tallinn. During that time Estonians' and Russian-speaking minority's out-of-home non-employment activity locations are different compared to ordinary time and observed language groups are more unevenly distributed in space.

In Tallinn during Estonian public and international holidays there are less Estonians outside their home and working areas and only on Estonian public holidays less Russian-speakers. Even though the language groups in Tallinn are slightly more unevenly distributed during Estonian public and international holidays, Russian-speakers are visiting Russian dominated

districts similarly to ordinary time. Interestingly, the only holiday category when Russian-speakers tend to significantly visit less Russian dominated districts in Tallinn is Russian public holidays. It is worth noting that during that time the spatial distribution is statistically the same as ordinary time. It therefore means that the places visited by Russian-speakers during that time can be located more in the centre of the city or near places where are more Estonians out-of-home non-employment activity locations.

However, Russian-speaking minority still tend to go to Russian dominated areas during some Russian holidays more than on ordinary time. The highest correlation is during Russian public holiday Russia Day, followed by Tatiana day and Orthodox Easter. It means that during this time Russian-speakers go more to areas where other Russian-speakers are living. So, even though some general conclusions can be drawn, every observed segregation aspect is highly dependent on specific holiday peculiarities.

On New Year's Eve (31.12) the number of Estonians and Russian-speakers increases the most when compared to week before outside of their home and working areas. This result can be attributed to New Year's celebrations which usually takes place in the city centre. However, on New Year's Day (01.01) Estonians and Russian-speakers are the most unevenly distributed ($ID=0.27$) across observed holidays in Tallinn. It is also a day when the number of Estonians increases the most (170%) in Estonia (outside Tallinn) compared to usual time, while for the Russian-speakers the increase is only 31% compared to ordinary time. The rise of unevenness can therefore be attributed to leaving Estonians, which raises the percentage of Russian-speakers in various districts in Tallinn.

While in Tallinn the relationship between the percentage of Russian speaking inhabitants and number of Russian-speakers in these districts vary among different holidays, then in Estonia outside Tallinn the relationship is quite straightforward: Russian-speakers tend to go to municipalities of their own language during holidays. It is also evident in the spatial distribution among Estonians and Russian-speakers, which is more uneven during holidays indicating a moderate level of segregation.

Two of the most influential holiday types across analysed segregation aspects outside Tallinn were Estonian public and international holidays, which indicate the role of free days. During Estonian public holidays all three aspects had the highest values; on international holiday the differences in the number of people, unevenness and the movements to Russian dominated areas were smaller. In addition, during Russian public holidays Estonians and Russian-speakers are significantly more unevenly distributed outside Tallinn, however, other segregation aspects did not significantly differ during this time.

Two of the most significant public holidays that differ from the routine time in Estonia outside Tallinn are Midsummer holiday (Midsummer Day 24.06 and Victory Day 23.06) and Christmas (24-26.12). During Christmas Estonians' space usage is much wider than of Russian-speakers'. It is also noteworthy that during these holidays the number of people is the smallest in Tallinn across observed holidays.

4. Discussion

4.1 Explaining ethnic differences during holidays

The goal of this study was to find out how holidays affect ethnic segregation of Estonians and Russian-speaking minority. On the most general level it is possible to conclude that during holidays, people's out-of-home non-employment activity locations are different compared to ordinary workdays or weekends. This is in line with previous studies in this matter (Isaacman et al 2011, Cools et al 2007, Cools et al 2010, Sepp 2010) that found differences in the people's spatial mobility during holidays. Overall the segregation was higher in Estonia outside Tallinn than in Tallinn during holidays. This study also showed that different holidays influence ethnic groups and their activity locations differently, which is similar to Fox (2006) case study. Estonians leave the capital during Estonian public and international holidays, while Russian-speakers only on Estonian public holidays. Segregation was the highest during Estonian public and international holidays both in- and outside Tallinn; in Estonia outside Tallinn it was also significantly higher on Russian public holidays when compared to ordinary time. When Russian-speakers leave the capital during holidays, they tend to go to municipalities with high percentage of Russian-speakers. In Tallinn, only on Russian public holidays Russian-speakers visit different districts (in terms of Russian-speaking inhabitants) when compared to ordinary time.

Explanations why people from different ethnic groups conduct various activities during holidays are highly dependent on the definition of holidays. When holidays are considered just as a time that is free, like it has been done mainly in transportation studies (e.g. Cools et al 2007), the differences in Estonians and Russian-speakers' out-of-home non-employment activities can be explained to some extent by disadvantage or marginality hypothesis. *Marginality hypothesis* states that lower socio-economic status of minorities can limit their leisure time opportunities (Johnson et al 2001, Floyd 1998). Estonian public holidays and international holidays which include temporally overlapping Estonian and Russian holidays represent mainly non-working days that offer the opportunity for travelling. Compared to Russian-speakers the number of Estonians is higher in Estonia outside Tallinn among both of these holiday categories which mean that Estonians are more likely to leave the home-city than Russian-speakers. While Russian-speaking minority is relatively concentrated to certain areas during holidays, Estonians' space usage outside Tallinn is much wider. This finding corresponds to other studies conducted in Estonia which claim that Russian-speaking minority's spatial behavior is more compact (Müürisepp 2013) and they visit smaller number of districts during leisure time than Estonians (Silm & Ahas 2014a). It can partly be explained by the disadvantaged position of the Russian-speakers, who have smaller income and higher unemployment-rate than the national average (Tammaru & Kulu 2003, Vöörman & Helemäe 2003). These factors can limit the access to transportation and information that is necessary for undertaking activities further away from home-city.

In addition, social networks also influence people's spatial behavior during holidays, because during free days it is possible to visit family (Wallendorf & Arnould 1991, Sepp 2010) and

friends which is important to strengthen the community-feeling (Close & Zikhan 2009). In this study the impact of social networks on ethnic segregation during holidays is very evident in Estonia outside Tallinn. The spatial distribution of Estonians and Russian-speakers outside Tallinn is moderately uneven during that time and Russian-speakers tend to visit places with high percentage of Russian speaking inhabitants. This finding depicts the influence of social networks that have the propensity of stimulating social activities and travel that are connected to friends, acquaintances and family (Carrasco & Miller 2006, Stodolska 2007). This finding is similar to Silm & Ahas (2014a) according to which Russian-speakers' tend to visit more districts that are mostly populated by the Russian-speaking minority. Estonians on the other hand have much wider social networks that explain why their spatial behaviour is spatially more far-reaching. The role of Russian-speakers' social networks in Tallinn is generally not so evident, although on certain Russian holidays like Russia Day, Russian-speaking minority is located more in districts where other Russian-speakers live.

However, Russian-speakers' socio-economic position and spatially concentrated social networks do not explain why in Tallinn they tend to visit *less* places of their own language during holidays nor why there are so big differences in Russian-speakers distribution during Midsummer holiday (23.06-24.06) and Christmas (24.12-26.12). It is quite clear that these factors alone cannot explain, for example, the differences in spatial behavior during Christmas and Midsummer holiday, since these factors would influence the ability to move during free days in a similar manner. It indicates that besides socio-economic position and social networks, there might be other explanatory factors behind different activity locations of Russian-speakers. The choice what to do during holidays can be affected by the *preferences* which in turn depend on ethnic peculiarities. *Ethnicity thesis* states that choices based on different cultural norms, values and traditions can contribute to ethnic segregation in different parts of human activity space (e.g. White et al 1993, Floyd 1999, Allison & Ceiger 1993). The standard approach for testing ethnicity thesis has been interpreting significant differences that remain after controlling the socio-economic factors as contributors to variability in leisure-time choices. This, however, does not explicitly indicate which element of ethnicity (Nagel 1994) contributes to differences in leisure-time segregation (Floyd 1998). Similarly, in this study it is also not possible to outline what is the main contributor for ethnic differences in activity locations during holidays, but it is quite clear that ethnic background plays an important role. It also indicates that some holidays are not "just free time" but are laden with cultural meanings and certain functions (Frolova 2013, Zhu 2010) that are important for particular ethnic groups thereby affecting their leisure-time (out-of-home non-employment) activity locations.

Cultural and religious traditions evident on holidays is one possible aspect of ethnicity that can explain the differences in Russian-speakers' activity-locations when compared to everyday life. Only on Russian public holidays Russian-speakers' out-of-home non-employment activities are differently located in Tallinn than on ordinary time. During this time Russian-speakers are visiting places with less Russian speaking inhabitants which means that these places are located more in the centre of the city or in districts where less Russian-speakers live. These places can be related to different activity locations for conducting

traditions and rituals. For example, on Victory Day (09.05), that belongs to Russian public holiday category and depicts victory and sorrow for WWII, Russians traditionally visit cemeteries and monuments (Frolova 2013). In Tallinn, many Russian-speakers gather near Bronze Soldier in Estonia's Defence Forces Cemetery (City Centre district) during this holiday. Another example when results indicate different spatial behavior probably due to traditions is Women's Day, which is a very popular holiday among Russians (Frolova 2013). During this time the average absolute number of Russian-speakers outside their home and working areas is the highest across all holidays in Tallinn and it can be explained by the tradition of buying flowers and gifts for female acquaintances. Big shopping areas are normally located outside the Russian-dominated districts in Tallinn. There are also more Estonians during this time in Tallinn, but the change compared to ordinary time is not so significant. Following traditions might be also evident during Orthodox Easter, when more Russian-speakers are located in Tallinn districts with many Russian-speaker inhabitants. During this time Russians tend to visit churches and cemeteries with family-relative members.

While according to ethnicity thesis the choices evident during holidays are not so "freely" chosen due to cultural traditions, then *identity thesis* provides explanation based on more free choice. According to identity thesis ethnic minorities avoid 'mainstream' activities (Aizlewood et al 2006) in order to keep their own identity and heritage and contrast themselves from another groups (Washburne 1980). They consciously choose to construct and preserve their identity by engaging in ethno-specific recreation (Karlis & Dawson 1995). This approach can to some extent possibly explain why less Russian-speakers leave Tallinn during Estonian public and international holidays compared to Estonians. For example, the reason why few Russian-speakers are leaving the capital during Christmas (compared to Midsummer holiday), even though it is accompanied also with free days, might be connected to the Russian cultural roots. Christmas in Russia is celebrated in January according to the old calendar (Frolova 2013); Russian-speaking minority in Estonia might not feel emotionally connected to Lutheran Christmas, because it is not part of their ethnic culture. They might either consider not worth celebrating it, like in the case study conducted by Fox (2006), or they consider celebrating it as a "threat" for their identity. For Estonians, however, this holiday is very important and it is usually spent in family-circle (Sepp 2010). Thus, ethnic segregation evident on Christmas is probably the result of different cultural attachment to these holidays: Estonians leave the capital and visit their family while Russian-speakers do not feel emotionally connected to this time and move less. This result is somewhat similar with Fox (2006) study where members of ethnic minority tended to deliberately avoid celebrating majority's holiday.

Although little elaborated, the idea of identity thesis puts leisure and leisure-time choices into a different context than it has been so far considered. Floyd (1998) states that majority of the leisure-time literature has seen leisure as a dependent variable, thus considering ethnicity as a factor that influences free-time choices, thereby supporting the ethnicity theory. Nevertheless, in the context of ethnic culture creation, leisure time may serve an enormous role in recreating a particular identity and it can be the "part of the mix of materials from which ethnicity is created, recreated and asserted" (Floyd 1998, Nagel 1994). In his view, leisure might be more

of an explanatory variable. This approach might, in my opinion, be applicable for the case of holidays and accompanying free time, since their function is to recreate cultural peculiarities (Fischer & Arnold 1990) and sustain national unity (Zhu 2012). Derived from this, activities undertaken during holidays may be important contributors to preservation of ethnicity. Although this study cannot directly prove this hypothesis, some results support the idea. For example, activities undertaken during Russian public holiday – Victory Day in Tallinn is more likely due to sustaining Russophone identity than being “enforced by the cultural traditions“. Therefore celebrating national, folk or public holidays might serve the purpose of recreating one’s identity both for majority and the ethnic minority in the host society. However, the relationship between leisure and ethnicity needs further explorations in order to confirm this argument.

Nevertheless, whether the choices occurring on holidays are the result of ethnicity or identity approach, they are still connected to the preferences of particular person. A choice to celebrate majority’s holiday may indicate a stronger attachment to the host society. The criterion of celebrating majority’s holidays has been used in studies that try to measure the level of integration (e.g. Eshel & Rosenthal-Sokolov 2000). According to the Study of Integration of Social Groups (2013) more integrated Russians are celebrating fewer Russian holidays than those who are less integrated. According to Seljamaa (2013) Midsummer holiday is also quite popular among Russian-speaking minority, therefore more Russian-speakers are likely to take part in the festivities, which can also refer to more integrated Russian-speakers. However, this study shows that Estonians are during that time mostly located in South- and West-Estonia, Russian-speakers are crowded in North- and East-Estonia in Russian-dominated districts. During that time the correlation and dissimilarity index in Estonia (excl Tallinn) was one of the highest across all observed holidays. This means that celebrating majority’s holiday does not necessarily indicate higher integration and do not contribute to the increase of inter-ethnic contacts. It can be hypothesized why Russian-speaking minority is celebrating this day. Is it because of accompanying free days, the essence of this particular holiday (bonfires, many parties and other activities) and the fact that the holiday takes place in summer when it is easier to travel. Or is it because in Russian culture they have a very similar holiday – Ivan Kupala that takes place in June or July depending on the calendar – and they actually celebrate the Russian holiday during the same time as Estonian Midsummer holiday. More in-depth studies are necessary to answer this question.

In Tallinn the segregation was the highest during New Year’s Day, which is an interesting result, given the fact that holiday celebrations are similar among both observed ethnic groups. It means that the norms, values and traditions derived from ethnic background probably do not matter here. Also, since it is international holiday, the festivities during that time cannot be attributed to reasserting one’s identity. So, the result can most probably be explained by the preferences to spend the holiday among own group (homophily principle) and social networks or marginality thesis which enables more well-off Estonians to leave the capital.

Current study is a contribution to existing segregation literature, because it combines spatial and temporal dimension of ethnic segregation. Toomet et al (2011) observed ethnic

segregation in different spaces and concluded that leisure segregation is lower than in residential or work space. It means that in leisure space ethnic groups are spatially less separated and the possibility for inter-ethnic contacts is higher. This contributes to consideration of leisure urban spaces as sites with higher integration potential (Peters & de Haan 2011). Although little studied, time can actually influence the integration potential of leisure spaces. For example, Silm & Ahas (2014b) found that ethnic segregation in Tallinn is higher during weekends than on working days. Similarly, current study shows that during holidays, which represent free time, ethnic groups tend to “self-segregate”, so leisure spaces are more segregated during this time compared to ordinary free time. This trend is applicable both for the case of Estonians and Russian-speakers. Segregation is the highest during Estonian public and international holidays, when more Estonians tend to leave the capital than Russian-speakers, therefore Estonians are the one who actually contribute more to increasing segregation. It also means that during holidays that represent relatively free time in terms of different structures, the integration potential is actually lower than the ordinary leisure-time. As already outlined, during Russian public holidays in Tallinn, Russian-speakers go less to districts with high percentage of Russian-speaking inhabitants. It means that during this time, the integration potential is actually higher, because Russian-speakers are outside their usual leisure space, however, due to several reasons. This finding can be also due to relatively small size of Tallinn, where the main activity locations are in the centre of the city (Toomet et al 2011). It means that in bigger multi-centered cities the results might be different.

What comes to success of integration in leisure time spaces, it is very important to keep in mind the actual motivations of ethnic groups and their undertaken activities during holidays. Also, although some general conclusions can be drawn from this study, ethnic differences are highly dependent on various holidays’ peculiarities. Motivations for different leisure-time choices remain, however, unclear since the focus and data of this study is not able to explicitly give explanations. When holidays are considered as free time, disadvantaged position of ethnic minorities might play more important role in explaining the leisure-time choices. When holidays are considered culturally important free time, then ethnicity and identity thesis can most probably explain occurring differences. To conclude, in segregation studies it is important to consider also the time-effect on leisure time segregation, since it can affect the integration potential, and to further elaborate the role of leisure in ethnicity which also affects the segregation in other parts of human activity space.

4.2 Methodological issues

Mobile positioning data gives new opportunities for ethnic segregation studies in terms of spatial and temporal scale. The effect of holidays can be seen only in long-term datasets, which give new possibilities for broadening the scope of ethnic segregation studies, thereby explaining the relationship between leisure and ethnicity. However, there are also some drawbacks for using this data. In the context of this study it is important to note that some holidays, like New Year’s Day favour making call-activities and compared to other holidays the number of call-activities is much bigger, which affects the precision of the data, because

more people leave their “digital footprint” in database. Although the influence of call activities on the number of people was minimized using aggregated data, there is still the possibility that during some holidays the intensity of making calls or sending SMSs is very low or high, which influences the number of people in different spatial units and can hide or overestimate the holiday effect. Also in some places, such as churches, people tend to usually make fewer call-activities than in other activity locations.

CDR data is a very valuable source for leisure-time ethnic studies due to its comprehensiveness in terms of sampling opportunities and temporal scale. For making general conclusions the data is very suitable, however, it does not provide answers to more specific questions and it lacks of individual information (Silm & Ahas 2014b) that can be important for explaining the holiday effect. Therefore in the future studies, it is necessary to combine these general results with more detailed data in order to find out the peculiarities of various holidays, their meanings and individual activity motivations.

In terms of used methods, some critics may be applied for holiday categories and the selection of holidays. For the sake of methodological cohesion, the selection of holidays was quite rigid and it can be argued whether included holidays are important enough. When combined into categories some unimportant holidays can diminish the influence of more important ones, therefore influencing the results. However, in this study there was no possibility to confidently distinguish more important holidays from unimportant ones without bringing in the subjective viewpoint. Perhaps in the future studies the focus could be set on holidays and their categories that had significant influence in this study.

In this study call activities that were made in the residence district were excluded for the sake of obtaining activities locations which represent leisure space. However, some holidays are quite home-centred and excluding in-home activities might have some effect on the results.

Conclusions

There is a growing attention towards the importance and influence of leisure time choices in social sciences due to diversification of leisure opportunities and a growing share of free-time activities in our everyday lives (Sheller & Urry 2006, Schlich et al 2007). Over the last years more segregation studies (e.g. Wong & Shaw 2011, Wang et al 2012) have considered activity space concept as an appropriate construct for observing the domains of individual's everyday life – home, work, leisure – where segregation can occur. This study is a contribution to this field, because it focuses on relatively little studied out-of-home non-employment sphere and temporal dimension of ethnic segregation.

The goal of this study was to explore the impact of holidays on ethnic segregation between Estonian and Russian-speakers from three aspects using mobile positioning data with the sample size of 12500 people. Three analysed aspects were a) the location of Estonians and Russian-speakers in Tallinn and Estonia (excl Tallinn); b) unevenness dimension of segregation measured by dissimilarity index; c) the influence of activity location's ethnic composition for Russian-speakers. Holiday effect was estimated by a) contrasting holidays with normal days, b) contrasting several holiday types with normal days.

On the most general level it is possible to conclude that holidays affect people's activity locations and their locations are different when compared to ordinary time. Current study also shows that even though holidays are different from ordinary time, holiday types such as Estonian and Russian public or international holidays have a particular effect people's spatial behaviour. On the contrary, Russian and Estonian other holidays do not have significant effects on neither of the language groups. These disparities occur on various spatial levels. It depicts different temporal layers of segregation, which also indicates different integration potential in leisure-spaces during various time-frames.

During holidays Estonian and Russian-speakers are spatially more segregated compared to ordinary time. Estonians leave the capital during Estonian public and international holidays, while Russian-speakers only on Estonian public holidays. Segregation was the highest during Estonian public and international holidays both in- and outside Tallinn; in Estonia outside Tallinn it was also significantly higher on Russian public holidays when compared to ordinary time. When Russian-speakers leave the capital during holidays, they tend to go to municipalities with high percentage of Russian-speakers. In Tallinn, only on Russian public holidays Russian-speakers visit different districts (in terms of Russian-speaking inhabitants) when compared to ordinary time. During that time they tend to visit districts with less percentage of Russian-speakers than on ordinary time.

To conclude, the results of this study showed that different holiday types have a different influence on the Estonians and Russian-speaking minority's spatial mobility and segregation. Outside the capital, Estonians movements are probably more related to emotional connection to particular holidays than it is for Russian-speakers. Their travels made on public holidays are highly connected to social networks and it is probable that the trips are not linked with emotional connectedness to Estonian holidays and integration process, but rather to a

possibility to visit members of social networks. In Tallinn, the choices derived from ethnic background or the wish to sustain Russophone identity is more probable, especially during Russian public holidays.

Kokkuvõte

Magistritöö „Etniline segregatsioon vaba aja tegevuskohtades riiklike ja rahvuslike pühade ajal“

Etniline segregatsioon on geograafide huviorbiidis olnud juba aastakümneid ning uute kontseptsioonide ja andmeallikate valguses saab see geograafiline protsess üha mitmekesisemat tähelepanu. Tegevusruumi kontseptsioon hõlmab erinevaid dimensioone, kus etnilised grupid võivad ruumilist eraldatust kogeda (Wong & Shaw 2011, Farber et al 2012). Wang jt (2012) järgi peaksid tegevusruumil põhinevad segregatsiooniuuringud vaatlema erinevaid ruumilisi – s.o eluruum, töökoht, vaba aeg – ja ajalisi mõõtmeid. Käesolev uurimistöö keskendub pühadeaegsele ruumikasutusele väljaspool elu- ja töökohta, hõlmates ka vaba aja tegevuskohti.

Magistritöö eesmärk on vaadelda ja seletada pühade mõju eestlaste ja venekeelse elanikkonna etnilisele segregatsioonile. Seejuures vaadeldi seda protsessi kolmest aspektist: a) kuidas muutub inimeste arv Tallinnas ja väljaspool Tallinna pühade ajal; b) milline on pühade mõju ruumilisele eraldatusele; c) kuidas mõjutab sihtkoha etniline koosseis pühadeaegseid tegevuskohti. Valim koosnes 12500 eesti ja vene keelt EMT'ga suhtluskeelena kasutavast uuritavast ja andmestiku moodustab nende nelja aasta (2007-2010) vältel tehtud kõnetoimingud, mis hangiti passiivse mobiilpositsioneerimise meetodi abil. Pühade mõju hindamiseks kasutati Poissoni regressioonanalüüsi ja üldiseid lineaarseid mudeleid (GLM). Sõltuvad tunnused olid peale eestlaste ja venekeelsete arvu veel erinevuse (*dissimilarity*) indeks ja Spearmani ρ . Esmalt vaadeldi mudelite abil, kas pühad üleüldiselt mõjutavad ruumikasutust, seejärel hinnati kuivõrd need erinevused ilmnevad erinevate pühade lõikes.

Pühad mõjutavad tavapäevadega võrreldes eestlaste ja venekeelsete inimeste ruumikasutust märkimisväärselt. Kuigi pühade ajal on üldiselt nii eestlasi kui venekeelseid Tallinnas vähem, mõjutavad pühade kategooriad inimeste tegevuskohti erinevalt. Käesolevast uurimistööst selgus, et Eesti, Vene riigi- ja rahvusvahelised mõjutavad inimeste ruumikasutust oluliselt, Eesti ja Vene rahvuslikud pühad aga mitte. See tulemus viitab etnilise segregatsiooni ajalisele varieeruvusele, mis mõjutab integreerumist ja rahvustevaheliste kontaktide potentsiaali ning seda just vaba aja ruumides.

Etnilise segregatsiooni tase on pühade ajal suurem kui tavapäevadel. Kui eestlased lahkuvad Tallinnast Eesti riigi- ja rahvusvaheliste pühade ajal, siis venekeelsed eelkõige Eesti riigipühade ajal. Eestlased ja venekeelsed uuritavad olid ruumiliselt kõige ebahühtlasemalt jaotunud nii Tallinnas kui väljaspool pealinna Eesti riigi- ja rahvusvaheliste pühade ajal; väljaspool Tallinna on etniline segregatsioon tavapäevadest statistiliselt oluliselt erinev ka Vene riigipühade ajal. Kui venekeelsed uuritavad lahkuvad Tallinnast, siis nad lähevad enamasti kõrge venekeelse elanike osatähtsusega omavalitsustesse. Tallinnas on ainult Vene riigipühade ajal statistiliselt oluline seos venekeelse elanikkonna ja vene keelt kõnelevate uuritavate osatähtsuse vahel tavapäevadega võrreldes. Sellel ajal viibivad venekeelsed inimesed ruumilistes üksustes, kus venekeelse elanikkonna osatähtsus on väiksem.

Kokkuvõtvalt võib väita, et pühad ja pühade liigid mõjutavad eestlaste ja venekeelsete ruumikasutust erinevalt ja sellel ajal on vaba aja segregatsioon suurem.

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