Full Length Article

European Journal of Communication
1–23

DOI: 10.1177/02673231221093185
journals.sagepub.com/home/ejc
SAGE

The interplay between digital and social inclusion in multiethnic Russian society: An empirical investigation

Anna Gladkova
Lomonosov Moscow State University, Russia

Nikita Argylov
Far Eastern Federal University, Russia

Maxim Shkurnikov
Faculty of Biology and Biotechnology, Higher School of Economics, Russia

Abstract

The paper discusses the digital inclusion of major and minor ethnic groups in Russia by comparing three broad categories of digital resources, identified in this study as components of the index of inclusion: information and communications technology (ICT) access, skills, and extent of engagement with technologies. Based on these components/subindices, we constructed an index of digital inclusion for the Russian context and tested it on a representative national sample of 765 Internet users (596 Russians, 196 Yakuts). Our study showed that Russians use more platforms for online access (mobile phones, laptops, consoles, smart TV, etc.) than Yakuts and access the Internet through a bigger number of locations, not being limited to home and/or office only. They also have higher level of social, technical, and creative ICT skills, and demonstrate higher levels of digital engagement and overall digital inclusion. We argue that the explanation here lies first of all in the geographical domain, that is traditional location of ethnic minority (Yakuts) in a region that is less digitally advantaged in terms of Internet access, cost, speed, and other factors (Far Eastern federal district), and is not related to ethnicity itself. We think therefore that this study is a good illustration of how the first and the second levels of the digital divide interrelate and influence each other, leading to a situation when people with lower access to the

Corresponding author:
Anna Gladkova, Faculty of Journalism, Lomonosov Moscow State University, 9 Mokhovaya Street, Moscow 125009, Russia.
Email: gladkova_a@listru

Internet and ICTs have lower skills and competences to use them, therefore risking to become digitally and also socially excluded.

Keywords
Digital inclusion, digital divide, ethnicity, ICTs, Yakuts, Russia

Introduction

The idea of digital inclusion presupposes that all individuals and groups have access and skills to use digital technologies irrespective of one's intersecting identities (e.g. age, color, race, citizenship, ethnic origin, place of origin, disability, education and employment, geographic location, and other factors) (ITU, 2020). Those who are excluded from this platform are at a disadvantage because they are unable to access information online and learn the necessary technical skills to participate in and derive the benefits from the digital realm (Van Deursen and Van Dijk, 2014).

Discussions of digital exclusion/digital inclusion have been for a long time framed mostly around the digital divide. They have focused on issues measured by access to the Internet and skills such as checking emails, finding information, and downloading music (Van Dijk and Hacker, 2003). However, since the introduction and widespread use of machine learning and artificial intelligence in different decision-making processes relating to citizens' life (e.g. health, justice, and policing), research on digital inclusion has shifted (Hargittai, 2002; Van Deursen and Van Dijk, 2014). This is because inequalities now involve more complex issues of how these technologies work and what and whom they can influence (Carmi and Yates, 2020). In this context, much has been written on digital inclusion of children and young people (Livingstone and Helsper, 2010), disabled people (Tsatsou, 2019), elderly people (Van Deursen and Helsper, 2015), and other social groups.

Little academic attention has been however given so far to the digital inclusion of ethnic minorities. This understudied area is of paramount importance, particularly in multicultural societies, where digital exclusion can lead to what Choudrie et al. (2018) understand as the risk of ethnic minorities' social exclusion. Being excluded from the digital realm, ethnic groups lack opportunities for self-representation, for enhancing their identity, benefitting from online services, (re)connecting with other social groups, and much more (Vartanova, 2018a). In this context, ensuring digital inclusion of all ethnic groups means ensuring equal opportunities for their development, for reaching their target audience, and airing their diverse views and interests in public. Pluralism in cyberspace also supports access of all citizens to a wide spectrum of cultural representations, values, and opinions of diverse communities (Matsaganis et al. 2011; Yu and Matsaganis, 2018). Last but not least, the digital inclusion of people with different cultural and social backgrounds is one of the fundamental contributors to building a multicultural society, where interests and cultural identities of all members of the society are equally respected and protected.

Previous research on ethnic inclusion reveals inequalities in online use and skills between ethnic groups in different national and cultural contexts. Exploring digital inclusion of ethnic groups in New Zealand, Grimes and White (2019) note that Pasifika has far lower Internet access rates at home and are much less likely to report spending any time on the Internet both at school and at home than Maori. Rahim et al. (2011) show that in Malaysia, Chinese are still ahead of the Malays and Indians when it comes to the use of the e-government services. Examining inequalities in material access, Van Deursen and Van Dijk (2018) show that representatives of the Dutch majority are more likely than ethnic minorities to have access to the device opportunity, device diversity, peripheral diversity, and device maintenance.

The number of works analyzing digital inclusion of ethnic groups in Russia is overall scarce, with ethnicity being almost always subsumed under certain socioeconomic characteristics such as age or level of income (Drobizheva, 2002) or under geographical factors such as the rural–urban split across Russian regions (Vartanova, 2018b). Another big group of studies focuses on ethnic groups' communication through online media channels (Danilov and Danilov 2019; Garifullin and Zagitov 2018) but does not specifically focus of digital use and digital skills of ethnic Internet users. One of the few studies approaching ethnic inclusion in Russia is a work by Gladkova et al. (2020) that empirically tests and discusses the level of Russian and non-Russian Internet users' digital capital, understood as a combination of digital access and digital competence parameters. The study showed that those belonging to the ethnic majority in Russia tend to have a higher level of digital capital compared to ethnic minorities (Gladkova et al. 2020). Overall, the issue of ethnicity and its role in digital and social inclusion of ethnic minorities remains understudied in the Russian context.

The paper aims to fill in this gap by analyzing digital inclusion of Yakuts (Sakha)[1], a minor ethnic group based in the Far Eastern federal district of Russia. Two research questions the study addresses are the following:

1. Are there signs of inequality in information and communications technology (ICT) access or skills between ethnic majority and ethnic minority in Russia, exemplified in this study by Russians and Yakuts?
2. Is there any relation between ethnicity and the degree of digital engagement—either frequency and/or type of engagement—of Russian and Yakut Internet users?

Both research questions are targeted toward an understanding of digital inclusion as a complex phenomenon embracing three main components: ICT access, ICT skills, and extent of engagement with technologies.

Background

Russian Federation is a unique example of a multiethnic and multicultural nation, with a total population of 146 million people, including over 190 ethnic groups speaking 170 languages (Federalnaya sluzhba gosudarstvennoi statitstiki, 2020). The country includes 8 federal districts divided into 85 federal subjects, 22 out of which are national republics within Russia. Some federal subjects have their own titular nations—dominant

non-Russian ethnic groups, typically after which the region was named (e.g. Republic of Sakha (Yakutia), Republic of Tatarstan, etc.), while others are predominantly populated by Russians (Republic of Karelia, Saratov oblast, etc.) (Federalnaya sluzhba gosudarstvennoi statitstiki, 2020).

Russian regions differ from each other economically (average salaries rate, GDP, size and efficiency of economy, etc.), geographically (territorial differences, distance from the large cities and the two main megapolises, Moscow and St Petersburg, etc.), socially (population density, size of urban/rural population, etc.), as well as ethnically and linguistically (the number of smaller ethnic and cultural groups). Exploring differences in the technological advancement of the Russian regions, Gladkova and Ragnedda (2020) note that "some of the regions (i.e. Central and Northwestern federal districts) are the country's leaders by digital access and/or digital literacy numbers (Internet penetration rate, speed, cost, number of users, digital literacy rate, etc.), while others (i.e. Far Eastern and North Caucasus federal districts) are sometimes lacking behind". The reasons for this technological inequality according to Vartanova (2009) are manifold: uneven connection of Russia by transportation and ICT infrastructures, first and foremost due to the unprecedented scale of the country; distance/isolation and urbanization level; availability of infrastructure and costs for building new infrastructure in regions with harsh climatic conditions; specific regional policies and public activism on place, and much more.

Current research on digital inequalities in Russian regions (Dobrinskaya and Martynenko, 2019; Rykov et al. 2017; Volchenko, 2016) showed that it remains still a serious problem in Russia when it comes to both access and use of ICTs. In this context, attempts have been made to explore how the age and education level influence the access to the Internet in Russia (Bykov and Hall, 2011); whether there is a correlation between the region of living, the distance from the city center, and the intensity of Internet use (Brodovskaya and Shumilova, 2013); how age, gender, level of income, education, region of living are related to the overall digital inclusion of Russians (Volchenko, 2016). Approaching digital inequalities in Russia from a broader interregional perspective, Gladkova et al. (2020) reveal clear differences between Russian regions on all three levels of the digital divide: access, use/skills, and benefits from using ICTs.

Digital inequalities across Russian regions are an important problem by themselves but they get extra importance if we look at multiethnic and multicultural character of the Russian society. Many indigenous groups are traditionally based in regions that are less economically advantaged (e.g. North Caucasus federal district) or have harsh climatic conditions and low urbanization levels (e.g. Far Eastern federal district or Northern Siberia), which affects the cost and speed of connection, as well as the availability of infrastructure and ICTs to a broad population in those regions (Volchenko, 2016). As Helsper (2008) notes, technological forms of exclusion are a reality for significant segments of the population, and for some people, they reinforce and deepen existing disadvantages. This is particularly true for Russia, where small ethnic groups are often underrepresented in online space due to lack of access, skills, motivation, or even technical abilities (lack of computer software or coding systems for some extinct languages), and therefore are missing benefits—both professional and personal (Ragnedda, 2018)—from online engagement.

The choice of Yakuts for this study was determined by several reasons. First, it is their belonging to ethnic minority (19th ethnic group in the country by size, with a total number of 478,000 Yakuts living in Russia), making them an illustrative group in the ethnic minorities' digital inclusion context. Second, it is their traditional location in the Far Eastern federal district—the largest (40% of the territory of Russia), the least populated (6.1 million people) among all federal districts of Russia, with exceptionally high urban/rural split and concentration of ethnic/indigenous population (e.g. Yakuts, Evenks, Chukchi, and others). Third, it is the exposure of Far Eastern population to the digital divide at the level of access (cost for connection that is up to three times higher than in other regions of Russia; lower broadband and mobile Internet speed, etc.) (Fedorov and Mikhailova, 2019) that is interestingly combined with a good result of the federal district by digital literacy index (fourth place among all federal districts of Russia: NAFI, 2020). Far Eastern part of Russia and Republic of Sakha (Yakutia) in particular are also interesting examples of how ICTs are becoming available to smaller ethnic and cultural communities due to regional and national policy measures to foster digitalization in the last years (federal Program of Eliminating Digital Inequality in Russia, *Vilyuysk express* and *Kobyaysk express* digitalization programs in Yakutia and others). So, choosing a minor ethnic group based in this region should be an interesting case study in the ethnic inclusion context.

Given the lack of comparative studies in the field of ethnic groups' digital inclusion in Russia, we expect this study to be the first measurement and exploratory analysis of the differences (if any) between minor and major ethnic groups' digital inclusion in the Russian Federation. We also believe this pilot study should be expanded in the future by comparing other ethnic groups based in different regions of the country, including, for example, Volga federal district with large population of ethnic groups and titular nations (e.g. Tatars, Bashkirs, Chuvash, and others), North Caucasus or other parts of the country.

Given challenges in accessing and using Internet in the Far East of Russia, as shown in previous studies (Gladkova and Ragnedda, 2020), we hypothesize that Yakuts' ICT access should be lower compared to the Russians' (H1).

The latest all-Russia survey of digital literacy index showed that despite problems with accessing ICTs, people living in the Far East of Russia have relatively high level of digital literacy index: 57 points (Far Eastern federal district where Yakuts are based) against 59 points (Central federal district where Russians are a dominant ethnic group) (NAFI, 2020). Therefore, we hypothesize that ICT skills of Russians and Yakuts should be at approximately the same level (H2).

Building upon the digital literacy index, we also hypothesize also that the digital engagement of Russians and Yakuts, measured through frequency and type of engagement is at approximately the same level (H3).

Previous research on Russia and other countries showed that sociodemographic patterns such as age and place of living can contribute to digital inclusion (Ragnedda et al. 2019; Van Deursen and Van Dijk, 2018; Volchenko, 2016). We, therefore, hypothesize that in the case of both Russians and Yakuts, age contributes negatively to digital inclusion (H4) and that those living in cities have higher level of digital inclusion than those living in rural areas (H5).

We also hypothesize that overall digital inclusion, embracing three components—access, skills, and engagement patterns does not differ between the two ethnic groups (H6). In this

last hypothesis, we agree with scholars arguing that ethnicity solely does not define the level of user's digital skills or digital inclusion, since there are other factors that should be taken on board—including location, availability of infrastructure in places where indigenous groups live, personal motivation and much more (Gladkova et al. 2020).

Materials and methods

The present study uses an online survey and draws on a representative national sample collected in Russia in summer/autumn 2020. To obtain a valid sample of the Russian population, we first used the snowball sampling method, receiving a broad variety of responses from users based in different regions of the country. To ensure representative character of the sample, we additionally used lists of professional contacts across the country and reached out to people living in rural areas of Yakutia during field trips in 2020. Our aim was to make sure we have a sample representative for both the Russian and Yakut populations of the country by age, gender, and urban/rural location parameters, allowing us to compare the two groups and make justified conclusions. The sample was then stratified using the latest all-Russia census, specifically looking at data on Russians and Yakuts. In total, we obtained a dataset with 1000 respondents over the age of 14 years. After excluding other ethnic groups from the sample, we ended up with 765 respondents (596 Russians, 196 Yakuts). Ethnic belonging was voluntarily defined by survey participants themselves. The survey was pilot tested with 20 Internet users. Amendments were made based on the feedback provided. The average time required to complete the survey was 12 min (Table 1).

To answer the research questions, we examined three broad categories of digital resources, previously identified by scholars as components of the index of inclusion: ICT access, skills, and extent of engagement with technologies (Helsper, 2008). Based on these components/subindices, we constructed index of inclusion for the Russian context, taking into account the country's multiethnic and multicultural character and the remaining digital inequalities across regions (Table 2).

Table 1. Sample description.

Parameter	Value Russians	Yakuts
Total number	569	196
Location		
Rural area	87 (15.29%)	92 (46.94%)
Urban area	482 (84.71%)	104 (53.06%)
Age		
Under 45	22 (12) year old; 428 (75.22%)	28 (16) year old; 133 (67.86%)
Over 45	55 (11) year old; 141 (24.78%)	53 (8) year old; 63 (32.14%)
Gender		
Female	458 (80.49%)	134 (68.37%)
Male	111 (19.51%)	62 (31.63%)

Table 2. Digital inclusion index.

Level 1	Level 2	Level 3	Description	Notes
Access	Type	Quality	Access quality	0 = no access; 1 = dial-up; 2 = broadband; 3 = wireless/mobile
		Source	Number of different platforms a person has access to	Mobile/smartphone; laptop; tablet; PC; multimedia/game console; smart TV; other (e-book, smartwatch, etc.) = 1 point each. Maximum 7 points
	Location	Quantity	Count of locations through which a person has access to Internet content	Home; office; friends' house; school/university; café; library; public Wi-Fi on the street, in the park, in subway, etc.; other (please specify) = 1 point each. Maximum 2 points
		Privacy	Scale of privacy in using the technology (home-work-school-library-Internet café)	Home = 5; office = 4, school/university = 3, library = 2, Internet café = 1. Maximum 9 points
ICT skills	General	Ability to use ICTs	Self-efficacy/self-related ability to use ICTs	Do you encounter difficulties in using ICTs? 0 = yes; 1 = unsure; 2 = no
		Ability to help others in using ICTs	Helping others in using ICTs in the last 3 months	Have you helped others with using ICTs in the last 3 months? 0 = no; 1 = unsure; 2 = yes
		Training	Presence/absence of special training in using ICTs	Did you have special training in using ICTs? 0 = no; 1 = unsure; 2 = yes
	Social	Privacy	Ability to protect personal information from unsolicited use by others	I know which information I should and shouldn't share online. 1 = not all true of me; 2 = untrue of me; 3 = unsure; 4 = neutral; 5 = somewhat true of me; 6 = true of me;

(Continued)

Table 2. (continued)

Level 1	Level 2	Level 3	Description	Notes
		Etiquette	Ability to distinguish appropriate and inappropriate online behavior	I can protect myself from cyberbullying and distinguish inappropriate online behaviour. 1 = not all true of me; 2 = untrue of me; 3 = unsure; 4 = neutral; 5 = somewhat true of me; 6 = true of me
		Comfort	Confidence in interacting with others	I can use Internet to stay connected with my family and friends. 1 = not all true of me; 2 = untrue of me; 3 = unsure; 4 = neutral; 5 = somewhat true of me; 6 = true of me
	Technical	Proxy	Level of help needed to use technologies	If you come across difficulties with using ICTs, how do you usually solve the problem? 0 = almost always ask for help; 1 = unsure; 2 = usually ask for help; 3 = sometimes ask for help and sometimes fix the problem myself; 4 = usually fix the problem myself; 5 = almost always fix the problem myself; 6 = never ask for help
		Production	Ability to fix technical tools when they break	I can fix a technical problem or know

(Continued)

Table 2. (continued)

Level 1	Level 2	Level 3	Description	Notes
				what to do in case of such problem. 1 = no; 2 = most likely not; 3 = unsure; 4 = yes and no; 5 = most likely yes; 6 = yes
		Protection	Regular update of private settings and antivirus software on all devices used for Internet access	I check my private settings from time to time and update antivirus software. 1 = no; 2 = most likely not; 3 = unsure; 4 = yes and no; 5 = most likely yes; 6 = yes
	Creative	Design	Created ICT content (text, photo, audio, moving images, audiovisual package)	I can produce digital content in different formats. 1 = no; 2 = most likely not; 3 = unsure; 4 = yes and no; 5 = most likely yes; 6 = yes
		Output	Platforms used for communication and self-expression	I actively use different programs for communication. 1 = no; 2 = most likely not; 3 = unsure; 4 = yes and no; 5 = most likely yes; 6 = yes
		Awareness	Ability to predict how created ICT content can influence one's future life	Content that I post online can influence my life in the future. 1 = totally disagree; 2 = disagree; 3 = unsure; 4 = yes and no; 5 = agree; 6 = fully agree
Digital engagement	Quantity	Frequency and breadth	How frequently the person uses Internet for different things (information search, learning, communication, social networking, etc.)	Making new friends; searching for a job; practising foreign language; social networking; staying connected with friends; staying connected with family members; buying products or services; playing online games; paying bills;

(Continued)

Table 2. (continued)

Level 1	Level 2	Level 3	Description	Notes
				following the news; planning travels; working; studying; downloading and listening to the music; watching movies and TV series; participating in political discussions = 1 point each. Maximum 16 points.
	Nature	Information	Information, learning and education	Working; studying; practising foreign language; following the news. 0 = never; 1 = very seldom; 2 = seldom; 3 = sometimes; 4 = often; 5 = very often. Maximum 20 points.
		Entertainment	Play and leisure	Playing online games; planning travels; downloading and listening to the music; watching movies and TV series. 0 = never; 1 = very seldom; 2 = seldom; 3 = sometimes; 4 = often; 5 = very often. Maximum 20 points.
		Communication	Individual communication and social networking	Making new friends; social networking; staying connected with friends; staying connected with family members. 0 = never; 1 = very seldom;

(Continued)

Table 2. (continued)

Level 1	Level 2	Level 3	Description	Notes
				2 = seldom; 3 = sometimes; 4 = often; 5 = very often. Maximum 20 points.
		Economic	Shopping and finances	Searching for a job; buying products or services; paying bills. 0 = never; 1 = very seldom; 2 = seldom; 3 = sometimes; 4 = often; 5 = very often. Maximum 15 points.
		Participatory	Civic and political participation	Participating in political discussions. 0 = never; 1 = very seldom; 2 = seldom; 3 = sometimes; 4 = often; 5 = very often

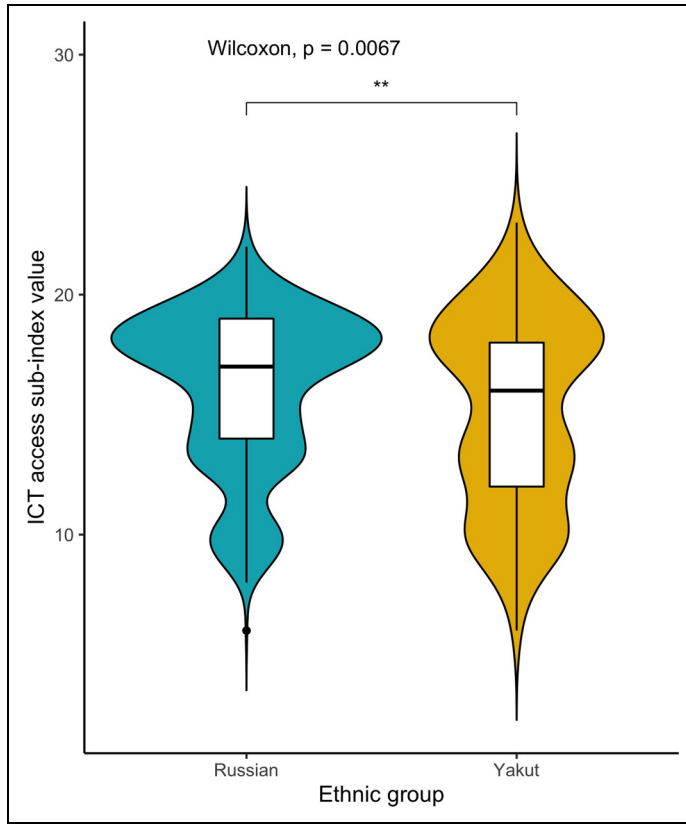

Figure 1. ICT access subindex.

To answer the first research question, we first compared the type and location of Russians' and Yakuts' online access. To study the *type of access*, we considered different types of Internet connection (e.g. dial-up, broadband, and wireless/mobile) and the total number of devices used to connect to the Internet. To study the *location of access*, we considered the total number of locations through which a person has access to Internet content and the scale of privacy in using the technology (home-work-school-library-Internet café). Moving on from the first level of the digital divide to the second one, we analyzed different types of *ICT skills* allowing for better digital inclusion: general, social, technical, and creative ICT skills. For the analysis of general ICT skills, we used a binary yes/no scale; all items related to social, technical, and creative ICT skills were scored on a 5-point Likert scale that ranged from "Not at all true of me" to "Very true of me". Examples of items are "I know which information I should and shouldn't share online" and "I can distinguish inappropriate online behavior". To measure the level of help needed to use technologies (included in technical skills), we used a 7-point Likert scale that ranged from "Almost always ask for help" to "Never ask for help".

Table 3. Results.

Parameter	Russian	Yakut	Wilcox	Flag	Dir
atQuality	5 (0), 4.7 ± 0.8	5 (2), 4.4 ± 0.9	3.85E-05	**	Rus > Yak
atSource	2 (1), 2.6 ± 1.1	2 (2), 2.4 ± 1.3	9.54E-04	**	Rus > Yak
alQuantity	2 (1), 1.7 ± 0.5	2 (1), 1.6 ± 0.5	2.97E-04	**	Rus > Yak
alPrivacy	8 (4), 7.1 ± 1.9	8 (4), 6.7 ± 2.2	0.095103312		
ict_to_use	2 (0), 1.7 ± 0.7	2 (0), 1.7 ± 0.7	0.428213721		
ict_to_help	2 (2), 1.1 ± 1	2 (2), 1.2 ± 0.9	0.128900225		
ictTraining	0 (0), 0.3 ± 0.6	0 (1), 0.4 ± 0.7	0.192851513		
ictPrivacy	6 (1), 5.2 ± 1.1	5 (2), 4.9 ± 1.2	5.98E-06	**	Rus > Yak
ictEtiquette	5 (2), 4.8 ± 1.4	4 (2), 4.1 ± 1.7	3.96E-08	**	Rus > Yak
ictComfort	5 (1), 5.2 ± 1	5 (1), 5.3 ± 0.8	0.844157309		
ictProxy	5 (1), 4.3 ± 1.4	4 (2), 4 ± 1.5	0.011256285		
ictProduction	4 (3), 3.8 ± 1.7	4 (3), 3.4 ± 1.5	0.003206591	**	Rus > Yak
ictProtection	5 (2), 4.4 ± 1.6	4 (3), 3.8 ± 1.6	5.46E-07	**	Rus > Yak
itcDesign	5 (2), 4.9 ± 1.4	4 (2.25), 4.1 ± 1.6	1.53E-09	**	Rus > Yak
itcOutput	6 (2), 4.9 ± 1.5	5 (2), 4.5 ± 1.5	2.52E-06	**	Rus > Yak
ictAwareness	4 (3), 3.4 ± 1.5	4 (3), 3.4 ± 1.5	0.743965498		
dFrequency	13 (3), 12.8 ± 2.4	13 (4), 12.5 ± 2.8	0.460466049		
dInformation	13 (6), 12.8 ± 4.1	12 (5), 11.5 ± 4.1	3.05E-04	**	Rus > Yak
dEntertainment	11 (6), 10.7 ± 4.3	10 (6), 9.6 ± 4.2	0.001608684	**	Rus > Yak
dCommunication	14 (4), 13.3 ± 3.5	14 (3), 13.2 ± 3.7	0.772677027		
dEconomic	8 (4), 7.3 ± 3.2	6 (5), 6.4 ± 3.3	8.74E-04	**	Rus > Yak
dParticipatory	0 (1), 0.7 ± 1.2	0 (2), 1 ± 1.3	0.008386932	**	Yak > Rus, $p < 0.01$

**$p <= 0.01$

To answer the second research question, we used a combination of two main approaches to measuring digital engagement: through a qualitative lens, focusing on the nature or content of engagement, or quantitatively through an evaluation of the number of things that people do use the technology (Helsper, 2008). We, therefore, considered Russians' and Yakuts' *frequency* of using the Internet for different things (information search, learning, social networking, etc.) and the *type of engagement* (information, entertainment, communication, economic, and participatory).

Normality of the analyzed parameters' distribution was tested using Shapiro–Wilk normality test with a significance level of 0.5. Wilcoxon rank-sum test with continuity correction was used for comparing differences between parameters with non-normal distribution. Correlation analysis was conducted using Spearman correlation test Parameter values are presented in medians (interquartile range) unless specifically noted.

Results

ICT access subindex was measured at 17 (5) for Russians and at 16 (6) for Yakuts. Value distribution is different from normal according to the Shapiro–Wilk normality test both

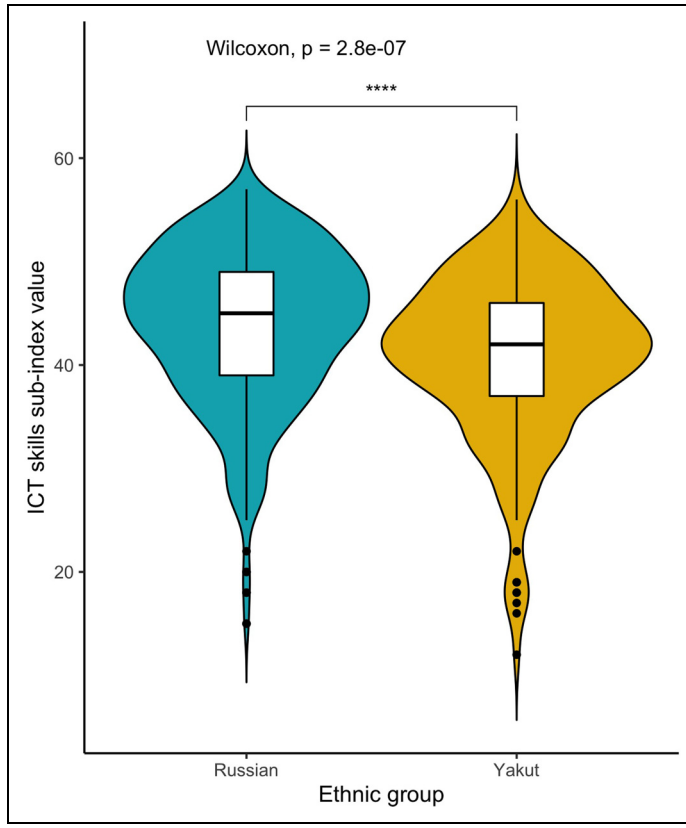

Figure 2. ICT skills subindex.

for Russians (p-value < 2.2e-16) and for Yakuts (p-value = 4.43e-07). Since value distribution is different from normal, significance was measured using Wilcoxon criteria. The p-value of the Wilcoxon rank-sum test with continuity correction is 0.0067, which is less than the significance level alpha = 0.05. We can conclude that Russians' median ICT access subindex value is significantly different from Yakuts' median ICT access subindex value with a p-value = 0.0067. In other words, Russians' ICT access subindex is higher than Yakuts' with a p-value = 0.003329 (Figure 1).

Table 3 shows statistically significant difference between Russians and Yakuts in three out of four parameters included in ICT access subindex: quality, source, and quantity of ICT access. H1 was therefore confirmed.

ICT skills subindex was measured at 45 (10) for Russians and 42 (9) for Yakuts. Value distribution is different from normal according to the Shapiro–Wilk normality test both for Russians (p-value = 1.265e-11) and for Yakuts (p-value = 3.851e-07). Since value distribution is different from normal, significance was measured using Wilcoxon criteria. The p-value of the Wilcoxon rank-sum test with continuity correction is = 2.787e-07,

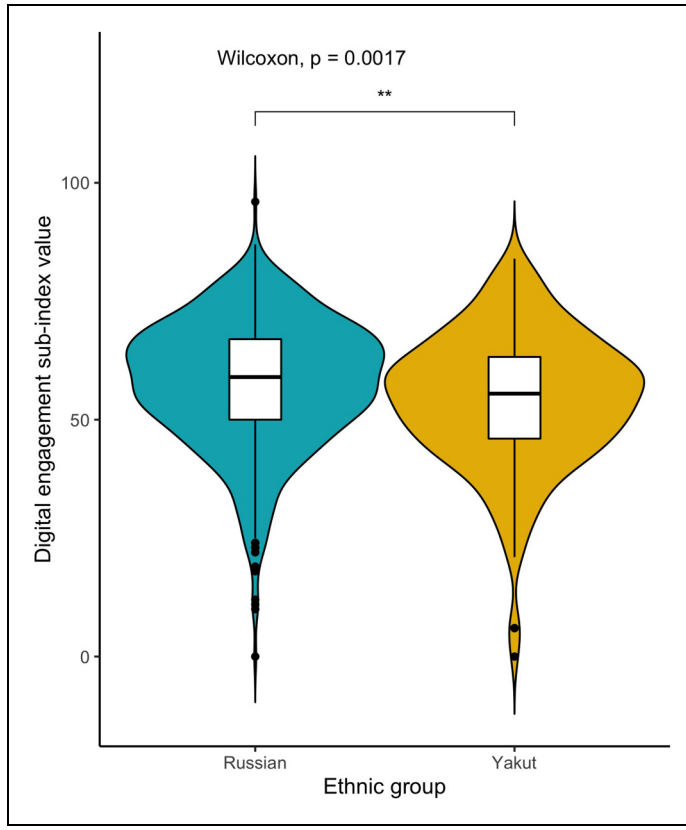

Figure 3. Digital engagement subindex.

which is less than the significance level alpha = 0.05. We can conclude that Russians' median ICT skills subindex value is significantly different from Yakuts' median ICT skills subindex value with a *p*-value = 2.787e-07. In other words, Russians' ICT skills subindex is higher than Yakuts' with a *p*-value = 1.394e-07. Table 3 also shows that there is no statistically significant difference between Russians and Yakuts in general ICT skills. Still, there is a difference in other types of skills: social (privacy and etiquette parameters), technical (production and protection), and creative (design and output). H2 was therefore not confirmed (Figure 2).

Digital engagement subindex was measured at 59 (17) for Russians and 55.5 (17.2) for Yakuts. Value distribution is different from normal according to the Shapiro–Wilk normality test both for Russians (*p*-value = 7.597e-08) and for Yakuts (*p*-value = 0.000441). Since value distribution is different from normal, significance was measured using Wilcoxon criteria. The *p*-value of the Wilcoxon rank-sum test with continuity correction is = 0.001658, which is less than the significance level alpha = 0.05. We can conclude that Russians' median ICT digital engagement subindex value is significantly higher

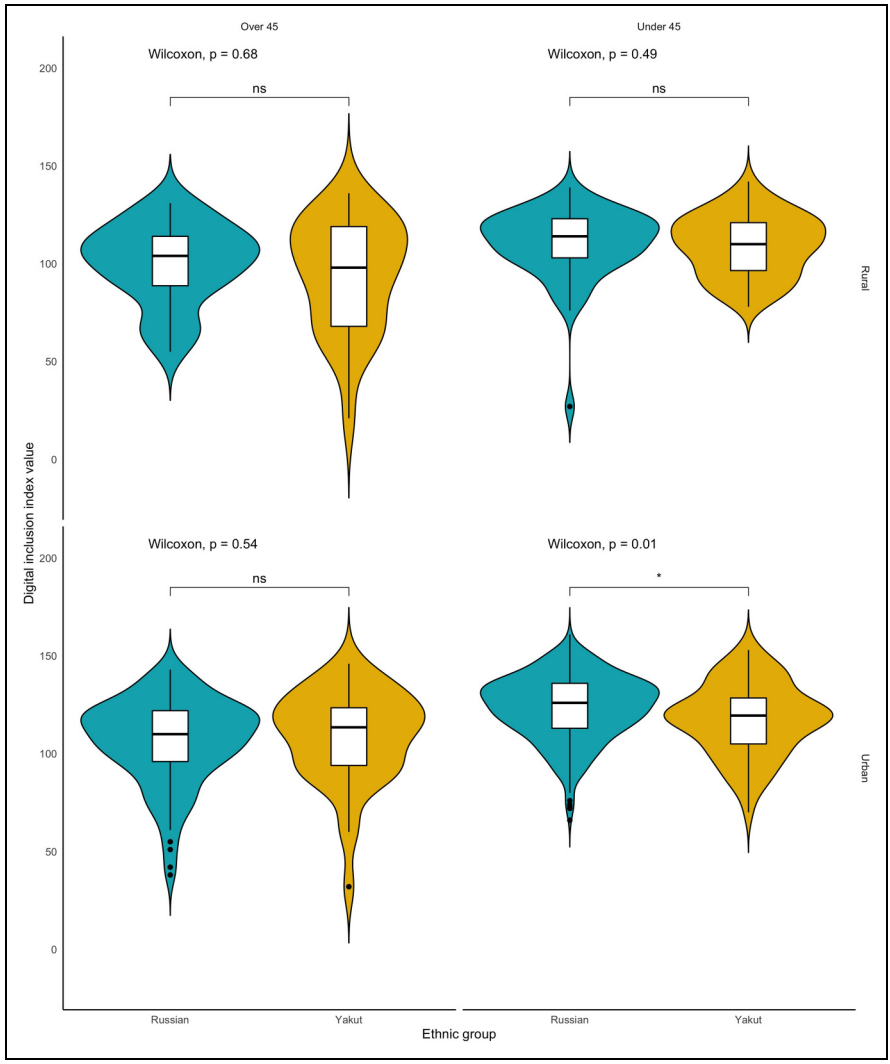

Figure 4. Digital inclusion and location.

than Yakuts' median ICT digital engagement subindex value with a p-value = 0.000829. Table 3 reveals statistically significant difference between Russians and Yakuts in all parameters, excluding frequency and breadth, and communication. The interesting thing is while Russians have higher results by information, entertainment, and economic parameters, Yakuts do better by participatory parameters. H3 was therefore not confirmed (Figure 3).

Testing H4, we found that value distribution is different from normal according to the Shapiro-Wilk normality test both for Russians (p-value = 1.346e-11) and for

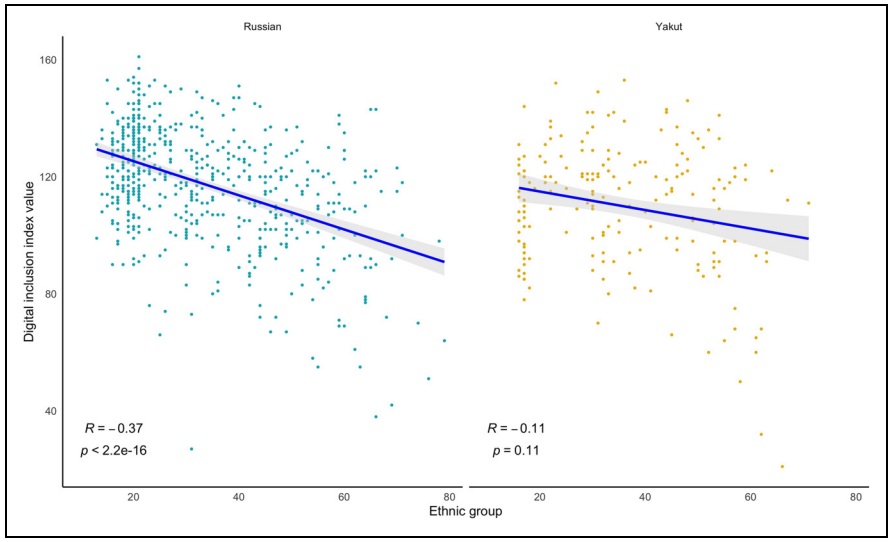

Figure 5. Digital inclusion and age.

Yakuts (p-value = 1.431e-05). Spearman's rank correlation rho was used for correlation analysis. In case of Russians, negative contribution (rho = −0.37) of age to digital inclusion is statistically significant (p-value < 2.2e-16) while in case of Yakuts age does not contribute to digital inclusion (p-value = 0.11). Still, there is a tendency for some negative contribution too (rho = −0.11). H4 was therefore only partially confirmed (Figure 4).

While testing H5, we found that the p-value of the Wilcoxon rank-sum test with continuity correction for urban respondents under 45 is = 0.01033, which is less than the significance level alpha = 0.05. Russians under 45 based in urban areas have significantly higher median digital inclusion index value compared to Yakuts under 45 based in urban areas with a p-value = 0.005167, although that was the only cross-ethnic difference that we found. In general, in case of both Russians and Yakuts, those living in cities have higher level of digital inclusion index than those living in rural areas. H5 was therefore confirmed (Figure 5).

Finally, overall digital inclusion index was measured at 120 (25) for Russians and 114 (27.2) for Yakuts. Value distribution is different from normal according to the Shapiro–Wilk normality test both for Russians (p-value = 1.346e-11) and for Yakuts (p-value = 1.431e-05). Since value distribution is different from normal, significance was measured using Wilcoxon criteria. The p-value of the Wilcoxon rank-sum test with continuity correction is = 3.976e-06, which is less than the significance level alpha = 0.05. We can conclude that Russians' overall digital inclusion index value is significantly higher than Yakuts' overall digital inclusion index value with a p-value = 1.988e-06. H5 was therefore not confirmed (Figure 6).

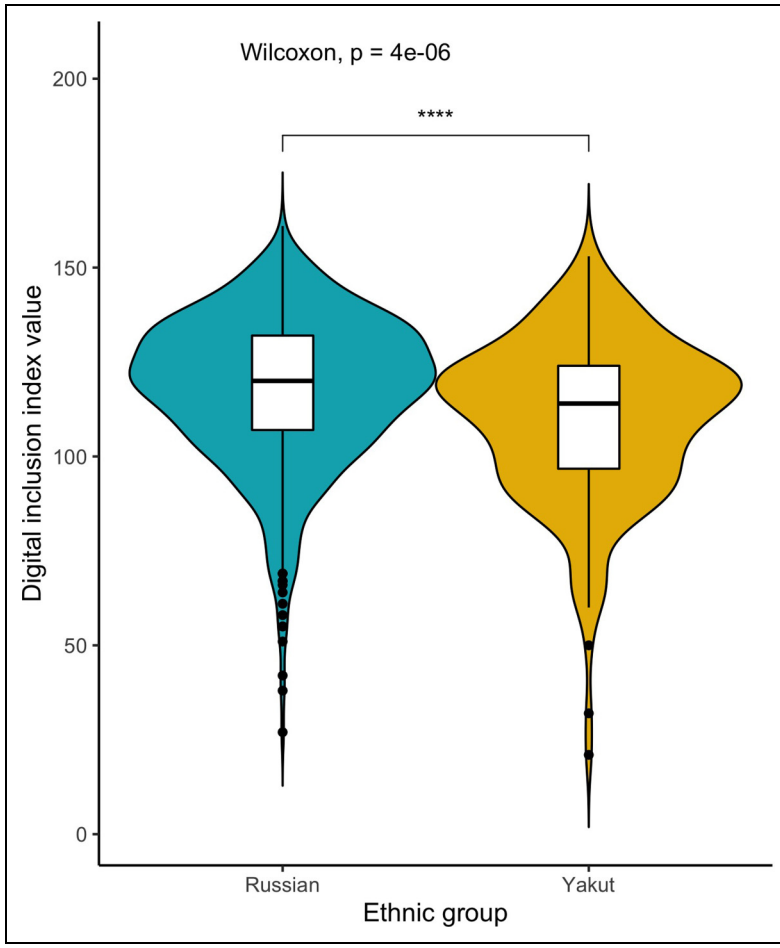

Figure 6. Overall digital inclusion index.

Discussion

The study revealed several interesting trends. In light of the first research question, we found differences between the ethnic majority (Russians) and ethnic minority (Yakuts) in both access and ICT skills. Yakuts more often than Russians use mobile phones only for going online, probably due to significant price differences, and the lack of broadband infrastructure in rural areas and local settlements ("uluses") around the city of Yakutsk, where most Yakuts live. To illustrate this: in 2020, the most affordable broadband connection through *Rostelekom* in Yakutsk costed 950 rubles/13 US dollars at 80 Mbit/sec (cf. 2450 rubles/33 US dollars at 100 Mbit/sec), while in the city of Olekminsk, 600 km from Yakutsk, the cost was already 2000 rubles/27 US dollars at 70 Mbit/sec (Rostelekom, 2020). For comparison, mobile connection with unlimited

Internet use through *MTS* or *Beeline* mobile operators in Yakutia is much lower—500–600 rubles/7–8 US dollars per month. In general, Russia was ranked the third country in the world by the cheapest cost of unlimited mobile connection (887.5 rubles/12 US dollars), according to the data of July 2020 (Content Review, 2020), which makes mobile phones one of the main devices for Internet access in the country.

Russians use more platforms for online access (mobile phones, laptops, consoles, smart TV, etc.) than Yakuts and access the Internet through a bigger number of locations, not just workplace/office or home. This can be again explained by some objective reasons —higher price for connection and lower availability of Wi-Fi in public places (transport, cafés, libraries), especially in small cities and rural areas of the Far East. Another important factor is that the Internet became available to the population of Yakutia in 2012 only when *TransTeleKom* built the 1100 km of first optic fiber lines there allowing for Internet access at 1.3 and 5 Mbit/sec speed. Although the Far East of Russia in general and Yakutia, in particular, have been developing fast in terms of digitalization in the recent years, we believe that remaining challenges (lack of infrastructure, cost for connection, cost for laying optic fiber line and building Wi-Fi spots at the territory with harsh climatic conditions and complicated relief, relatively short history of Internet in Yakutia, etc.) affect the way people access ICT in the region.

General ICT skills, including users' self-efficacy, ability to help others in using ICTs, and presence/absence of special training in using ICTs do not differ between the two ethnic groups. Still, Russians have better results by social ICT skills (ability to protect personal information from unsolicited use by others; ability to distinguish inappropriate online behavior), technical ICT skills (ability to fix technical tools when they break; regular update of private settings and antivirus software on the devices used for Internet access), and creative ICT skills (ability to create content in different formats: text, photo, audio, moving images, audiovisual package). This is in line with the recent study by NAFI (2020) showing that the Far Eastern federal district has lower result in the digital security parameter, and digital content creation parameter compared to Central or Northwestern federal districts which are predominantly populated by Russians.

We believe that this difference in ICT skills between Russians and Yakuts can be explained by lower access of Yakuts to the Internet and subsequently less developed set of digital skills (due to lack of practice or personal motivation to use technologies), rather than by their ethnic belonging. This is proved by the fact that young Yakuts living in urban areas have lower digital inclusion results than young Russians living in urban areas. Facing issues with accessing the Internet (more expensive than in other parts of the country, slower speed, public Wi-Fi not everywhere available, plus in some cases personal motivational issues), Yakuts may have less practice using ICTs and therefore lower skills too. We assume that any other minor ethnic group based in a region with low Internet penetration/high Internet cost/lack of infrastructure, etc., would show more or less similar results in this study. Here we agree with scholars (Lin et al., 2015) arguing that there is no "racial divide" in Internet use since the role played by ethnicity—in determining online use—is relatively modest. Speaking broadly, we believe digital inclusion index can be used in other national and cultural contexts for a deeper understanding of the digital divide and digital inclusion specifics in the

country, for testing the inclusion of different ethnic groups, and possibly also for introducing policy-making and technological initiatives accordingly, if needed.

In light of the second research question, although we revealed that Russians' digital engagement subindex value is significantly higher than Yakuts', the difference here lies not in the frequency of using ICTs in general but in the type of engagement. Russians tend to use the Internet more often for work, study, leisure, shopping, finding new job, planning travels purposes than Yakuts. We believe that—again—having lower access to ICTs, Yakuts use them less often for some daily practices/routines compared to Russians. Communication and social networking patterns at the same time do not differ between the two groups, also because for many Yakuts social networks and messengers, especially WhatsApp are in some way "similar" to the Internet itself. They use messengers for communication, exchanging photo and video files, joining interest groups, reading news, etc., which leads to a situation when some Yakuts do not even have email or are not engaged with other activities online except for messengers and social networks[2]. Furthermore, lifestyle and culture can play some role in digital engagement too: many Yakuts are based in "uluses" or live in rural areas where things like online shopping or online job search are not really widespread or needed. At the same time, Yakuts showed better results in our study by civic and political participation parameters. While the difference is statistically significant it is not dramatic: 65.7% of Russians reported that they never engage in political discussions online, while among Yakuts that number was 55.1%. For comparison, the number of those who answered "sometimes" was 7.7% and 11.7% correspondingly. This trend may be in some way explained by the collectivist nature of Yakut culture (Bokhan et al., 2016), contributing to the political and civic activism of people. Still, political engagement of ethnic groups and the reasons behind is a separate topic that deserves closer examination in another research.

In this paper, we build upon scholarship on digital inclusion and digital inequalities. We also contribute to both research streams by discussing a specific case study derived from multiethnic and multicultural Russian society. Our study is a good illustration of how the first and the second levels of the digital divide here interrelate and influence each other (Van Deursen and Van Dijk, 2014), leading to a situation when people with lower access to Internet and ICTs have lower skills and competences to use them, therefore risking to become digitally excluded. We do not believe that ethnic or racial belonging solely can influence the way people access technologies, use them or benefit from them. Despite the fact that our study revealed a difference between ethnic majority and ethnic minority groups in all three subindices (e.g. ICT access, skills, and engagement), as well as the overall digital inclusion index, we think that the explanation here lies first of all in the geographical domain, that is location of ethnic minority in a region that is less digitally advantaged, in our case Far Eastern part of Russia, and is not related to ethnicity itself. We agree with Mervyn et al. (2014) arguing that digital exclusion can lead to social exclusion in the globalized world, and believe that in the new digital environment, more attention from both academic and policymakers should be given to the digital inclusion of minor ethnic groups, giving them opportunities for professional and personal growth, enhancing their own identity, networking, self-representation, etc., therefore contributing to social inclusion of ethnic groups and overall social harmony in multiethnic and multicultural society.

Finally, we believe that the choice of just one minor ethnic group and the use of online survey method do not allow for generalizing results, which can be partially or totally different in the case of other ethnic groups living in Russia—in terms of access, skills, engagement, or any other aspects. Further research on digital inclusion involving other ethnic groups, probably based in different federal districts, can be a good way to compare data across geographical and cultural domains and discuss how digital inclusion is related to the social inclusion of minor ethnic groups. A study of ethnic groups' digital cultures (Dunas and Vartanov, 2020) and the relation of those cultures to the social, political, economic, and cultural processes can be another area for future research in the digital inclusion/social inclusion (Helsper 2008) context.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Presidential grant council for the state support of young Russian scholars (grant number MK-795.2020.6).

ORCID iDs

Anna Gladkova https://orcid.org/0000-0001-7102-6425
Nikita Argylov https://orcid.org/0000-0003-3600-3193

Notes

1. Yakuts and Sakha can be used interchangeably; Sakha is a traditional name of this ethnic group in Yakut language, meaning "white" or "sunny", while in official documents and public discourse, representatives of this ethnic group are usually called Yakuts.
2. Here, we are certainly not speaking for all Yakut population of Russia, but these specifics of Yakut online behaviour was mentioned to the authors several times during data gathering, by Yakuts themselves, so we found it worth mentioning here.

References

Bokhan T, Terekhina O, Bokhan N, et al. (2016) Manifestations of collectivism-individualism in the context of ethnocultural factors of depression. *Bulletin of Kemerovo State University* 4: 126–133.

Brodovskaya E and Shumilova O (2013) Rossiskie polzovateli i nepolzovateli: sootnoshenie i osnovnye osobennosti [Russian users and non-users: correlation and main peculiarities]. *Monitoring Obshchestvennogo Mneniya* 3(115): 5–18.

Bykov I and Hall T (2011) Tsifrovoe neravenstvo i politicheckie predpochteniya Internet-polzovatelei v Rossii [Digital divide and political preferences of Russian Internet users]. *Polis (Bologna, Italy)* 5: 151–163.

Carmi E and Yates SJ (2020) Digital inclusion and data literacy. *Internet Policy Review* 9(2). DOI: 10.14763/2020.2.1474. https://policyreview.info/digital-inclusion

Choudrie J, Tsatsou P and Kurnia S (2018) *Social Inclusion and Usability of ICT-Enabled Services*. New York: Routledge.

Content Review (2020) Available at: https://www.tadviser.ru/index.php/Статья:Мобильный_ШПД_интернет_%28рынок_России%29, accessed March 1, 2022

Danilov AP and Danilov AA (2019) Etapy i tendentsii stanovleniya etnicheskoi zhurnalistiki v Chuvashii [Stages and trends of ethnic journalism development in Chuvashia]. *Vestnik Chuvashskogo Gosudarstvennogo Pedagogicheskogo Universiteta* 5: 28–34.

Dobrinskaya DE and Martynenko TS (2019) Defining the digital divide in Russia: key features and trends. *Monitoring of Public Opinion: Economic and Social Changes* 5: 100–119.

Drobizheva L (ed.) (2002) *Sotsialnoe Neravenstvo Etnicheskikh Grupp: Predstavleniya i Realnost [Social Inequality of Ethnic Groups: Ideas and Reality]*. Moscow: Academia.

Dunas D and Vartanov S (2020) Emerging digital media culture in Russia: modeling the media consumption of Generation Z. *Journal of Multicultural Discourses* 15(2): 186–203.

Federalnaya sluzhba gosudarstvennoi statitstiki [Federal State Statistics Service] (2020) Available at: http://www.gks.ru/F

Fedorov Y and Mikhailova A (2019) Potentsial razvitiya rynka sputnikovogo Interneta v severnykh ulusakh Respubliki Sakha (Yakutia) [Potential for the development of the satellite Internet market in the Northern uluses of the Republic of Sakha (Yakutia)]. *Ekonomika i Predprinimatelstvo* 7(108): 537–542.

Garifullin VZ and Zagitov LR (2018) Rol' blogosfery v razvitii natsionalnogo internet-prostranstva [The role of blogosphere in the development of the national online environment]. *Uchenye Zapiski Kazanskogo Universiteta. Seriya Gumanitarnye Nauki* 160(4): 872–883.

Gladkova A and Ragnedda M (2020) Exploring digital inequalities in Russia: an interregional comparative analysis. *Online Information Review* 44(4): 767–786.

Gladkova A, Vartanova E and Ragnedda M (2020) Digital divide and digital capital in multiethnic Russian society. *Journal of Multicultural Discourses* 15(2): 126–147.

Grimes A and White D (2019) Digital inclusion and well-being in New Zealand. Available at: http://motu-www.motu.org.nz/wpapers/19_17.pdf

Hargittai E (2002) Second level digital divide: differences in people's online skills. *First Monday* 7(4). doi:10.5210/fm.v7i4.942. https://firstmonday.org/ojs/index.php/fm/article/view/942

Helsper E (2008) *Digital Inclusion: An Analysis of Social Disadvantage and the Information Society*. UK, London: Department for Communities and Local Government.

International Telecommunications Union (ITU) (2020) Available at: https://www.itu.int/

Lin CA, Atkin DJ, Cappotto C, et al. (2015) Ethnicity, digital divides and uses of the Internet for health information. *Computers in Human Behavior* 51: 216–223.

Livingstone S and Helsper E (2010) Balancing opportunities and risks in teenagers' use of the internet: the role of online skills and internet self-efficacy. *New Media & Society* 12(2): 309–329.

Matsaganis MD, Katz VS and Ball-Rokeach SJ (2011) *Understanding Ethnic Media: Producers, Consumers, and Societies*. New York: Sage.

Mervyn K, Simon A and Allen DK (2014) Digital inclusion and social inclusion: a tale of two cities. *Information, Communication and Society* 17(9): 1086–1104.

NAFI Research center (2020) Available at: https://nafi.ru/analytics/tsifrovaya-gramotnost-rossiyan-issledovanie-2020/

Ragnedda M (2018) Conceptualizing digital capital. *Telematics and Informatics* 35(8): 2366–2375.

Ragnedda M, Ruiu ML and Addeo F (2019) Measuring digital capital: an empirical investigation. *New Media & Society* 1: 1–24.

Rahim SA, Pawanteh L and Salman A (2011) Digital inclusion: the way forward for equality in a multiethnic society. *The Innovation Journal: The Public Sector Innovation Journal* 16(3): 2–12. https://www.innovation.cc/scholarly-style/2011_16_3_11_samsudin-rahim_web-inculsion.pdf

Rostelekom (2020) Available at: https://sakha.rt.ru

Rykov Y, Nagornyy O and Koltsova O (2017) Digital inequality in Russia through the use of a social network site: a cross-regional comparison. *Communications in Computer and Information Science* 745: 70–83.

Tsatsou P (2019) Digital inclusion of people with disabilities: a qualitative study of intra-disability diversity in the digital realm. *Behaviour & Information Technology* 39(9): 995–1010.

Van Deursen AJ and Helsper E (2015) A nuanced understanding of Internet use and non-use among the elderly. *European Journal of Communication* 30(2): 171–187.

Van Deursen AJ and Van Dijk JA (2014) The digital divide shifts to differences in usage. *New Media & Society* 16(3): 507–526.

Van Deursen AJ and Van Dijk JA (2018) The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media & Society* 21(2): 354–375.

Van Dijk JA and Hacker K (2003) The digital divide as a complex and dynamic phenomenon. *The Information Society* 19(4): 315–326.

Vartanova E (2009) De-Sovietizing Russian media studies. In: Thussu DK (ed.) *Internationalizing Media Studies*. New York: Routledge, pp.214–227.

Vartanova E (2018a) Kontseptualizatsiya tsifrovogo neravenstva: osnovnye etapy [Conceptualizing digital divide: main stages]. *MediaAlmanah* 5(88): 8–12.

Vartanova E (2018b) Teoriya media kak perekrestok nauchnykh podkhodov i metodov [Media theory as a crossroad of academic approaches and methods]. *Voprosy Teorii i Praktiki Zhurnalistiki* 7(1): 165–176.

Volchenko O (2016) Dinamika tsifrovogo neravenstva v Rossii [Dynamics of the digital divide in Russia]. *Monitoring Obshchestvennogo Mneniya* 5: 163–182.

Yu SS and Matsaganis MD (2018) *Ethnic Media in the Digital Age*. New York: Routledge.