



First- and second-level digital divides in Cuba: Differences in Internet motivation, access, skills and usage

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Abstract

The digital divide is an important academic concern. Whereas the first generation of studies focused only on physical and material Internet access, more recent research has considered the importance of skills and usage gaps. This study seeks to bring to light meaningful insights into first and second levels of the digital divide in the special case of Cuba, which is characterized by a very restricted media environment. Results reveal that in an admittedly socialist country where inequality is very present, increased access to the Internet might particularly benefit those who are already in privileged positions.

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Introduction

Although fundamentally socialist, Cuba can be characterized as a country with large social inequalities, which are primarily caused by a dual economy that is differentiated by the tourist convertible peso and the domestic national peso (Leech, 2015). Approximately 40 percent of the Cuban population exists on a state salary, earning just enough to cover basic needs. The other 60 percent can afford a certain amount of luxuries, such as spending convertible pesos in the more expensive tourist restaurants, hotels and stores or utilizing new public Wi-Fi hotspots that have been established throughout the island (Leech, 2015). In addition to these Wi-Fi hotspots, the Cuban government has recently reduced prices and increased the speed of Internet access at state-run cybercafés (<https://freedomhouse.org>, 2015). This is an interesting development for two reasons. First, Cuba is known to be one of the world's most repressive settings for information and communication technologies (ICTs). Causes for the lack of Internet access in Cuba are the U.S. embargo, the Cuban economy and the government's fear of information freedom (Press, 2011). The Cuban government has always been suspicious of the advancement of new technologies and the effects that they may have on the maintenance of its socialist system (Baron and Hall, 2014). Second, such changes are occurring under difficult economic circumstances, and recent studies have suggested that Internet access potentially reinforces existing notions of social inequality. Although one might argue that the Internet in Cuba would allow a more pluralized public space by opening access to Web sites that were once inaccessible, it is very likely that Internet access is still limited to a select few. It is estimated that only five percent of the population has full access to the Internet, mostly via government institutions, foreign embassies, expensive connections in hotels or black market sales (<https://freedomhouse.org>, 2015). Even when more people obtain access, the Internet tends to reinforce social inequality and leads to the formation of disadvantaged and excluded individuals because of differences in skills and uses (Van Dijk, 2005; Witte and Mannon, 2010).

Research studying Internet access from an inequality perspective is mostly embedded in the digital divide realm. The concept of the digital divide stems from a comparative perspective of

social and information inequality and depends on the idea that there are benefits associated with Internet access and negative consequences of non-access. The original notion of the digital divide focused on individuals' access to Internet infrastructure (Newhagen and Bucy, 2005). As more people obtained access, second-level divides in skills and usage patterns drew attention (e.g., Dimaggio, *et al.*, 2004; Katz and Rice, 2002; Zillien and Hargittai, 2009). The aim of this paper is to bring to light meaningful insights into both the first- and second-level digital divides in the particular setting of Cuba, where full access to the Internet is finally, albeit slowly, being introduced. Through a survey of Cuban Internet users, we aim to answer to what extent the first- and second-level digital divides manifest themselves among those who are online.

Theoretical background

First- and second-level digital divides

Van Dijk (2005) distinguishes four types of access that are necessary to obtain full access to a technology: motivation, access, skills and usage. Motivation and, in particular, access are mostly referred to as the first-level digital divide. In recent years, the digital divide debate has centered on the acquisition of the skills required to use the Internet efficiently and effectively and on the types of use that people perform online, which is also referred to as the second-level digital divide. Scholars of digital inequality often use one of these access types as the dependent variable and then consider individual, socioeconomic or geographical factors as determinants.

Motivation. People who remain on the 'wrong' side of the digital divide because of motivational problems are referred to as 'want-nots.' Van Dijk's (2005) notion of motivational access is primarily shaped by attitudes towards technology. Negative attitudes towards technology, such as computer anxiety, have been shown to decrease access to the Internet (Van Dijk, 2005), negatively influence patterns of Internet use (Meuter, *et al.*, 2003), and prevent minorities from accessing it (Rojas, *et al.*, 2004). In Cuba, people in general are eager to obtain Internet access for greater levels of connectivity both within and outside the island (Dye, *et al.*, 2016). One of the biggest motivations for Cubans to start using a new technology comes with the fact that nearly every Cuban has family members outside Cuba, many of whom have not been in contact for years. In addition, phone calls to people outside Cuba are expensive, and the Internet is thus opening new communication possibilities (Dye, *et al.*, 2016). Another particular motivation for Cubans to use the Internet is to obtain more information about the inside and outside worlds; people with Internet access often retrieve content for others and broadcast information to their local communities (Dye, *et al.*, 2016).

Material access. After motivation, Van Dijk (2005) frames the concept of material access, or the opportunity and means to access the Internet. In digital divide research, attention in public opinion and policy-making has long focused on this type of access (Newhagen and Bucy 2005; Van Dijk 2005). Material access first entails the place of the Internet connection, where having an Internet connection at home leads to a higher-quality experience and broader use (Choudrie and Dwivedi, 2005). Home access also offers more freedom to use and develop digital skills through informal learning than does access in other locations (Buckingham, 2005; Livingstone, 2003). Conversely, Internet access in Cuba is under state control and is regulated by the Law of Security of Information, which prohibits access to Internet services from private homes except in extraordinary circumstances. Internet access is mainly through government-run computer clubs and schools as well as places of employment, with the exception of some black market venues. Material access also entails expenses for hardware, software and services (Van Dijk, 2005). Although the material divides in developed countries are increasingly visible in terms of the devices used to access the Internet (differences in Internet use on laptops, handheld computers, smartphones, game consoles and interactive televisions), in Cuba — although mobile phone use has quadrupled since it was legalized in 2008 — very limited mobile Internet service is available due to restricted infrastructure (<https://freedomhouse.org>, 2015).

Internet skills. In the digital divide realm, studies on digital skills originally considered mainly technical aspects, also referred to as 'button-knowledge.' Lately, a more pluralistic understanding has emerged. Van Deursen, *et al.* (2016) conceptualized, operationalized and validated an Internet skills framework consisting of four types of skills. Operational skills are the basic technical skills required to use the Internet and are often referred to as 'button knowledge.' Information navigation skills relate to searching your way around information, including the ability to find, select and evaluate sources of information on the Internet. Operational and information navigation skills relate to Web 1.0 activities, which are fundamental for the skills that form Web 2.0 activities: social and creative skills. Social skills encompass the ability to use online communication and interactions to understand and exchange meaning, which entails searching, selecting, evaluating and acting upon contacts online, attracting attention online, profiling and the social ability to pool knowledge and exchange meaning. Creative skills are the skills needed to create content of an acceptable quality to be published or shared with others on the Internet. This concerns textual, music and video, photo, multimedia and remixed content but also the more basic level of uploading material. All of these skills combined provide an elaborate view of what is required for the general population to function well in an online environment. The distinction avoids a

technologically deterministic viewpoint by both accounting for aspects related to the use of the Internet as a medium (operational) and substantive aspects related to the content provided by the Internet (information navigation, social and creative).

Internet use. The actual use of the Internet is the final stage of appropriation (Van Dijk, 2005) and is mostly defined in terms of frequency, the length of time the Internet is used or the type of activities performed online. The last is increasingly the focus of attention when investigating how people in different social groups use the Internet after obtaining access (Blank and Groselj, 2014; Hargittai and Hinnant, 2008; Livingstone and Helsper, 2007; Robinson, 2009; Van Deursen and Van Dijk, 2014). The current contribution builds on the 'traditional' classifications of potential areas of exclusion in its theorization. Four key domains from which an individual can be excluded off-line have corresponding domains of exclusion in the digital world (Helsper, 2012). First are uses in the economic field, a concept related to poverty, joblessness and wealth. Think of using the Internet for financial services or shopping. In addition, the economic field refers to selling something online, job-seeking or looking for learning opportunities to improve one's job prospects. Second are uses in the cultural field, which encompass knowledge, education and understanding the value of entertainment, art and other socio-cultural distinctions that compose social status and are related to belonging to certain socio-cultural groups. The third field is related to social resources and reflects involvement in and attachment to networks that give a person access to the knowledge and support of others. Thus, there are a range of Internet uses that could be part of this process, including connecting with family members and sharing photos or linking up with friends. We expect that in Cuba in particular, this type of Internet use is popular because most people in Cuba do not have consistent access to any type of communications technology. As a result, social media, especially Facebook, is likely to be used as a central communications channel both with others in Cuba and to reach people abroad (Dye, *et al.*, 2016). The fourth field concerns personal resources, which reflect mental and physical well-being and aptitudes. This also includes self-actualization or informal knowledge gathering that makes individuals feel better about themselves.

Determinants of the digital divide

Digital divide studies have provided many variables that account for differences in motivation, skills, material access and usage. In this respect, to explore who benefits most from Internet use in Cuba we analyse the respective weight of common background variables for all four access types. We expect that the characteristics that are traditionally associated with first- and second-level divides are also at play in the Cuban context.

Gender. Although the physical access gender gap has diminished in many developed countries, men use the Internet more than women do because of more prior exposure to technology and of work-related requirements (*e.g.*, Cooper, 2006; Meraz, 2008; Wasserman and Richmond-Abbott, 2005). Recent studies furthermore reveal significant differences in what men and women do online (Meraz, 2008; Zillien and Hargittai, 2009).

Age is the second powerful predictor of Internet use. Older adults tend to experience the lowest Internet attitude levels (*e.g.*, Marquié, *et al.*, 2002) and make the least use of digital devices (*e.g.*, Zickhur and Madden, 2012). Age also has a negative relationship with medium-related Internet skills, and due to the conditional nature of Internet skills, also with content-related Internet skills (Van Deursen, *et al.*, 2011). Because of earlier exposure and training, peer use and greater comfort with new technology, younger people exhibit the highest diversity of Internet use (*e.g.*, Blank and Groselj, 2014).

The most consistent determinant in digital divide research is probably *educational level of attainment* (*e.g.*, DiMaggio, *et al.*, 2004; Katz and Rice, 2002; Van Dijk, 2005). A positive relation between educational level of attainment and Internet use results from greater awareness, better training, higher capabilities and greater abilities to evaluate content (Rice, *et al.*, 2001). People with lower educational levels have less material access (Van Dijk, 2005), lower levels of Internet skills (Van Deursen, *et al.*, 2011; Hargittai, 2002) and use the Internet in less beneficial ways (*e.g.*, Hargittai and Hinnant, 2008; Livingstone and Helsper, 2007).

Income is positively related to Internet adoption in terms of a greater capacity to afford the costs of material access (*e.g.*, Goldfarb and Prince, 2008; Katz and Rice, 2002; Livingstone and Helsper, 2007; Ono and Zavodny, 2007; Van Dijk, 2005). Furthermore, low income groups exhibit more negative attitudes towards the Internet (Barzilai-Nahon, 2006). Persons of higher income use the Internet more efficaciously, employ the Internet more productively and to greater economic advantage (DiMaggio, *et al.*, 2004), while people with lower levels of income status tend to use the Internet more generally and superficially (Van Dijk, 2005).

Internet experience, often mentioned as a direct competitor of education and consistently demonstrated to be a strong predictor of Internet usage types (*e.g.*, Hargittai and Hinnant, 2008; Livingstone and Helsper, 2007; Zillien and Hargittai, 2009). Furthermore, Internet experience appears to be relevant for performing on Internet skills (Hargittai, 2002), especially medium-related Internet skills (Press, 2011).

Since Internet patterns mirror aspects of social structures (Van Dijk, 2005), the final factor we will account for is *residency*. People in rural areas have less Internet access given their lower levels of education and income and lower levels of access to broadband connections (Hale, *et al.*, 2010).

Materials and methods

Sample

In Cuba, the percentage of people using the Internet for more than just e-mailing is low, thus posing a challenge to survey those who do. In this respect, this paper should be considered an explorative study of those who are online in Cuba. We conducted both an online and off-line survey over a period of four weeks in June 2016. The target group was people with at least six months of Internet experience, living in and outside the Cuban capital, Havana. The participants may be considered privileged but, in most cases, live under similar economic conditions as do those without Internet access. Due to legal restrictions on conducting a survey, we used snowball sampling by asking initial and second-wave contacts to refer the researcher to additional participants. Invitations were sent out in three different ways: via e-mail, social media, and off-line recruitment conducted in the first week of June in a Wi-Fi park. A total of 106 online surveys were collected online (e-encuesta.com) of which 22 were rejected due to incomplete responses. A total of 22 off-line, completed surveys were collected, this gives us a total of 106 completed responses ($N=106$). The mean age of the respondents was 28.8 ($SD=7.3$), 57.5 percent female, 15 percent low-educated, 70 percent medium educated and 15 percent high educated. Finally, 64 percent of the respondents lived in an urban area.

Measures

Pretesting of the survey was conducted in two rounds. In the first round, 10 cognitive interviews were conducted. Cognitive interviewing concerns systematically developing survey questions through investigations that intensively probe the thought processes of individuals who are presented with those inquiries (Willis, 2005). Questions that surfaced as problematic were evaluated and adjusted. The second round consisted of online survey pilot tests with the specific aim of testing for reliability and other characteristics of the constructed scales. Note that the scales, of which most were English originally, were translated into Spanish. The time required to answer the final survey was approximately 20 minutes.

Internet attitude ($M=4.04$, $SD=0.70$) was adapted from an instrument by Durndell and Haag (2002). A five-point agreement scale was used on eight items. A factor analysis extracted three components above Eigenvalue 1 and factor loading of .4 or above (Hair, *et al.*, 2006). The items 'The Internet is responsible for many good things' ($M=4.32$, $SD=0.76$) 'Life is easier and faster thanks to the Internet' ($M=4.24$, $SD=0.85$) and 'The Internet increases the standard of living' ($M=3.58$, $SD=1.04$) were included in the study. Cronbach's alpha = .70.

Place of Internet use was measured by offering the respondents a list with the following options; home (23 percent), work (89 percent), somewhere else (21 percent). The type of device to connect to the Internet was measured by offering the respondents a list with the options: desktop (74 percent), laptop (34 percent), tablet (13 percent) and mobile phone (44 percent).

Internet skills were measured using the Internet Skills Scale (Dye, *et al.*, 2016). This 20-item instrument accounts for operational, information navigation, social and creative skills. Items are scored on a five-point agreement scale and exhibited high internal consistency. See [Table 1](#).

Table 1: Descriptive and Cronbach's alpha for Internet skills.
Notes: Five-point scale ranging from 1 (Not at all true of me) to 5 (Very true of me). $N = 106$.

	<i>M</i>	<i>SD</i>
Operational ($\alpha = .85$)	4.60	0.70
I know how to open downloaded files	4.60	0.89
I know how to download/save a photo I found online	4.74	0.65
I know how to use shortcut keys (<i>e.g.</i> , CTRL-C for copy, CTRL-S for save)	4.50	1.00
I know how to open a new tab in my browser I know how to bookmark a Web site	4.82	0.62
I know where to click to go to a different Web page	4.37	1.10
Information navigation ($\alpha = .81$) (recoded)	3.96	0.57
I find it hard to decide what the best keywords are to use for online searches	4.31	1.05
I find it hard to find a Web site I visited before	4.57	0.82
I get tired when looking for information online	4.53	0.67
Sometimes I end up on Web sites without knowing how I got there	2.68	1.24
I find the way in which many Web sites are designed	3.73	1.07

confusing		
Social ($\alpha = .82$)	4.53	0.56
I know which information I should and shouldn't share online	4.39	0.81
I know when I should and shouldn't share information online	4.45	0.72
I am careful to make my comments and behaviors appropriate to the situation I find myself in online	4.49	0.94
I know how to change who I share content with (e.g., friends, friends of friends or public)	4.66	0.66
I know how to remove friends from my contact lists	4.66	0.73
Creative ($\alpha = .74$)	3.14	0.96
I know how to create something new from existing online images, music or video	4.01	1.22
I know how to make basic changes to the content that others have produced	3.39	1.34
I know how to design a Web site I know which different types of licences apply to online content	2.66	1.38
I would feel confident putting video content I have created online	2.40	1.26
I know which apps/software are safe to download	2.40	1.17
I am confident about writing a comment on a blog, Web site or forum	2.45	1.23
I would feel confident writing and commenting online	3.25	1.25

Internet usage types were measured by a scale developed by Dye, *et al.* (2016). This scale mapped specific types of uses onto four different resource domains: Economic, cultural, social and personal. Economic types of uses were categorized as income (savings and earnings), employment (productivity/ promotions/jobs), finance (investments and contracts), and education (grades/degrees). Cultural types of uses consisted of items measuring belonging (*i.e.*, how the Internet facilitates an understanding of the self as part of a socio-cultural group) and identity (uses specifically related to issues of gender, ethnic, generational or religious identity). The uses in the social domain were based on political and civic participation, and research into strong and weak or bridging and bonding ties. In the personal domain, we considered items concerning health, leisure and self-actualization (*e.g.*, discuss a topic of personal interest with others online). Respondents were asked for each of the four domains to indicate to what extent they use the Internet for various activities using a five-point scale ('never' to 'daily') as an ordinal-level measure. See [Table 2](#).

Table 2: Descriptive statistics and Cronbach's alpha of type of usage.		
Notes: Seven-point scale ranging from 1 (Never) to 7 (I don't know). $N = 106$.		
	M	SD
Economic — Property ($\alpha = .74$)	1.63	1.09
Look for information on how to sell something you own	1.80	1.32
Respond to people's requests for information about a product or service you want to sell	1.48	1.03
Put a product up for sale	1.62	0.94
Economic — Employment ($\alpha = .74$)	2.72	1.68
Integrate tools or apps you have downloaded into the way you work	3.26	1.85
Look for a different job online	2.46	1.65
Talk to others online about job opportunities	2.44	1.67
Economic — Education ($\alpha = .74$)	2.59	1.50
Look for information about a course or course provide	2.73	1.48
Check other opinions about a course or place to study	2.34	1.44
Download course materials	2.71	1.60
Cultural — Identity ($\alpha = .74$)	2.72	1.68
Come across information about differences between men and women	3.26	1.80
Come across 'adult' sites with sexual content	2.05	1.41
Interact with people who share your ethnicity	4.14	1.89

Cultural — Belonging ($\alpha = .74$)		
Read information on parenting	2.66	1.69
Arrange with other people to go out	3.09	1.72
Log in on a Web site with religious or spiritual content	1.64	1.18
Social — Personal network ($\alpha = .74$)	4.52	1.12
Comment on the updates friends or family put online	4.55	1.18
Talk to family or friends who live further away	5.00	1.01
Share pictures of you with your family or friends	4.02	1.19
Social — Formal network ($\alpha = .74$)	3.59	1.66
Look for information (online or off-line) on clubs or societies	2.78	1.77
Interact with people who share your personal interests and hobbies	4.16	1.47
Comment about a political or societal issue	3.84	1.76
Social — Political network ($\alpha = .74$)	2.46	1.67
Look for information about national government services	1.93	1.64
Ask a representative of a public institution for advice on public services	3.16	1.66
Look for information about an MP, local councillor, political party or candidate	2.31	1.72
Personal — Health and lifestyle ($\alpha = .74$)	2.92	1.51
Talk to others about your lifestyle	3.48	1.65
Look up information on how to improve your fitness	2.65	1.53
Ask others about a training program	1.95	1.38
Personal — Self-actualization ($\alpha = .74$)	3.89	1.32
Exchange information about events or concerts with others	3.23	1.35
Look up information to understand problems or issues that interest you	4.41	1.15
Consult other opinions on problems or issues that interest you	4.04	1.48
Personal — Leisure ($\alpha = .74$)	2.59	1.50
Play games	1.34	0.90
Listen to music	2.76	1.76
Watch videos/ TV programs	2.85	1.62

Gender was included as a dichotomous variable. Age was computed by subtracting the reported year of birth from the survey year. Education was collected by degree as one of four categories following the Cuban education system classification. These data were subsequently divided into three groups of low, middle and high educational level. Income was collected by amount as one of four categories (10–20 CUC, 20–30 CUC, 30–40 CUC, more than 40 CUC). Residency was coded as a dichotomous variable, urban or rural. Frequency of Internet use was measured by asking respondents how often they use the Internet; once per month (one percent), 2–3 times per month (one percent), 2–3 times per week (14 percent), 1–2 times a day (22 percent) and more than twice a day (62 percent). Internet experience was measured by asking respondents how long they have been using the Internet; 1–4 years (20 percent), 5–9 years (52 percent), 10–14 years (20 percent), 15–19 years (9 percent).

Data analysis

Multiple and logistic regression analyses were conducted in order to identify the most important predictors of the four types of Internet access. A regression analysis is a statistical process for approximating the relationships between variables and aids to understand how values of the dependent variable (motivation, access, skills and type of Internet usage) changes when anyone of the independent variables (gender, age, educational level, income, Internet experience, frequency and location) is varied, while other independent variables are assumed fixed.



Results

First-level digital divide

Motivation. [Table 3](#) shows that Internet experience positively determines the attitude towards the Internet. No other variables appeared as significant.

Table 3: Linear models with Internet attitude and the number of devices used to connect to the Internet as dependent variables. Notes: *significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Explanatory variables	Internet attitude	Number of devices used for Internet
	β	β
Gender (M/F)	.01	-.14
Age	-.19	-.26**
Education (ref. low)		
Middle	.15	-.12
High	.03	-.18
Income	-.16	.15
Internet frequency	.10	-.05
Internet experience	.30**	.37***
Residency (Urban/Rural)	.03	-.08
R ² , Adj. R ²	.04	.17
F	1.46***	2.04**

Material access is measured in terms of devices used to connect to the Internet and in terms of places where people connect. [Table 3](#) reveals that the number of devices used is determined by age (negatively) and Internet experience (positively). [Table 4](#) shows that education is predictive for using a desktop computer to access the Internet. Those with middle and higher levels of education are more likely to use a desktop computer to connect to the Internet. People with lower levels of education are more likely to use a mobile phone, as are those with a higher income. Internet experience has a positive effect on using the Internet on laptop, mobiles and tablets. Finally, people in urban areas are more likely to use a laptop for Internet purposes.

In terms of the place where the Internet is accessed, [Table 6](#) shows that people with higher levels of education are more likely to access the Internet at work and are less likely to use the Internet at home. Younger people are more likely to use the Internet at work, whereas older people are more likely to use the Internet at home. Finally, the more the Internet is used, the more likely it is accessed at work.

Table 4: Logistic models with devices used to connect to the Internet as dependent variables ($N = 106$). Notes: *significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Explanatory variables	Device used				Place	
	Desktop	Laptop	Mobile	Tablet	Work	Home
	β	β	β	β	β	β
Gender (M/F)	0.46	0.89	0.66	0.79	1.96	0.71
Age	0.86	0.48	0.54	0.52	0.29*	2.63**
Education (ref. low)						
Middle	4.96**	0.36	0.25*	0.61	4.71*	0.29
High	12.29**	0.32	0.06***	0.42	8.75*	0.09**
Income	0.72	1.40	1.57**	0.92	1.09	1.03
Frequency	0.90	1.47*	0.79	0.70	1.87**	1.24
Experience	1.15	2.09*	2.03*	2.43*	1.17	1.55
Residency (Urban/Rural)	2.21	0.29**	1.07	0.57	4.33	0.45
Constant	2.09	0.15*	1.65	0.40	0.37	0.06**
Nagelkerke R ²	.22	.31	.20	.11	.24	.23

<i>Chi-square</i>	15.16	23.22***	14.84	5.47	24.38***	15.47
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Internet skills. Table 5 shows that age and the amount of time spent online are the most significant predictors of Internet skills. Younger people tend to perform better on operational, information navigation, social and creative Internet skills compared to older individuals. The more time people spend online, the better their Internet skills are.

Table 5: Linear models with Internet skills as dependent variables.
Notes: *significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Explanatory variables	Operational	Information navigation	Social	Creative
	β	β	β	β
Gender (M/F)	-.11	.14	-.02	.12
Age	-.42***	-.32***	-.36***	-.22**
Education (ref. low)				
Middle	.01	-.04	-.06	-.14
High	.13	.00	-.03	.07
Income	.01	-.13	.08	-.12
Internet frequency	.37***	.36***	.31***	.41***
Internet experience	.06	.08	.13	.12
Residency (Urban/Rural)	.1	-.07	.13	-.03
R ²	.34	.25	.23	.23
F	5.35***	3.33***	3.13***	3.10***

Internet usage. Regarding the type of Internet use, or what people do online, several significant differences can be observed. Concerning gender, females tend to use the Internet more for cultural belonging purposes. Age is negatively related to economic employment uses and personal self-actualization purposes. Those with medium and higher levels of education are more likely to use the Internet for social-formal and cultural-identity and cultural-belonging purposes than do those with lower levels of education. Those with lower income levels are more likely to use the Internet for social-political and cultural-belonging purposes. The amount of Internet use is positively related to social-informal and formal uses and to cultural-identity, personal-self-actualization and personal-leisure activities. Finally, those living in rural areas are more likely to use the Internet for personal-self-actualization activities.

Table 6: Linear models with Internet usage types as dependent variables (N=106).
Notes: *significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Explanatory variables	Economic – Property	Economic – Employment	Economic – Education	Social – Informal	Social – Formal	Social – Political
	β	β	β	β	β	β
Gender (M/F)	.01	-.16	.01	.00	.16	.18
Age	-.06	.24*	-.06	.02	-.07	-.10
Education (ref. low)						
Middle	.14	.02	.14	.07	.37**	.23
High	.13	.04	.13	.01	.28*	.10
Income	.02	-.09	-.02	-.02	-.07	-.25*
Internet frequency	.05	.02	-.05	.42***	.23*	.11
Internet experience	.11	.22*	.11	.03	-.06	-.04
Residency (Urban/Rural)	.04	.02	-.04	.08	.09	.02

R ²	.03	.10	.03	.19	.18	.12
F	0.28	1.11	0.28	2.32*	2.21*	1.44

Table 6 continued: Linear models with Internet usage types as dependent variables ($N=106$).

Notes: *significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Explanatory variables	Cultural – Identity	Cultural – Belonging	Personal – Health	Personal – Self-actualization	Personal – Leisure
	β	β	β	β	β
Gender (M/F)	-.03	.22*	-.06	-.03	.03
Age	-.09	-.08	.00	-.32***	.07
Education (ref. low)					
Middle	30**	.18	-.20	.08	-.23
High	.35**	.29*	-.16	.15	-.12
Income	-.16	-.32***	-.08	.03	-.03
Internet frequency	.26**	.14	.13	.28***	.24**
Internet experience	-.02	.10	.07	.07	.05
Residency (Urban/Rural)	.05	-.07	.12	.18*	.02
R ²	.18	.16	.05	.22	.08
F	2.17*	1.97	0.56	2.90**	0.92*

Discussion and conclusions

Main findings

The aim of the current study was to provide insight in who is benefitting from Internet use in a country where Internet penetration rates are low and social inequality is high. Our study was theory-driven by focusing on how inequality can manifest itself in Internet attitude, material access, skills and economic, cultural, social and personal types of Internet use. When the socio-demographic characteristics that are traditionally associated with first- (*i.e.*, differences in attitudes and access) and second-level (*i.e.*, differences in skills and use) divides were included in the analysis, the results showed that these characteristics stand in each of the four stages of Internet appropriation. In particular, the elderly, those with lower levels of education, those with fewer opportunities for Internet use and, thus, with lower chances of building Internet experiences were less likely to benefit from Internet use. The process of Internet use seems to replicate existing social inequalities because digitally mediated networks replicate offline structures and because off-line human capital carries over to the online world (DiMaggio and Garip, 2012; Norris, 2001). An important mechanism here is amplification, which suggests that the Internet is primarily a magnifier of existing stratification. Thus, when inequality in society rises, the Internet tends to reinforce this trend. Another important mechanism is the statistical power law which suggests a polarized distribution in which, on the one hand, there is a growing number of people who use the Internet increasingly for different purposes on high-quality devices but, on the other hand, there is also an expansion of people who experience this process comparatively slowly, for example, because they use lower-quality devices. The greater one's capacity is, the more the Internet delivers; conversely, the lower one's capacity is, the less value the Internet has. In an admittedly socialist country where inequality is very present, a surge in Internet use might help more people contact others outside the island; however, there is also certainly the danger that the Internet will benefit those who are already privileged.

When looking more specifically at the differences identified in the study, we can first conclude that differences between men and women only surfaced in types of use, as those related to cultural-belonging types of Internet use were found, which suggests that women are more likely to use the Internet to belong to certain socio-cultural groups, which might help them learn and understand the normative conceptualizations of what is good or bad, what is sophisticated or kitsch, and what is proper and improper (Helsper, 2012). The elderly had fewer skills and engaged less in economic-employment types of use and personal self-actualization. Those with lower levels of education are less likely to connect to the Internet

with desktop computers at work and are thus less likely to experience a high-quality, reliable connection. Furthermore, they tend to use the Internet less for cultural-identity and formal networking purposes, observations that fit the usage gap thesis.

Internet experience appears to be very important for gaining a positive attitude towards the Internet. This conclusion can be linked to what recent research has shown, that the more people experience the Internet, the faster they engage with deeper Internet usage, thereby broadening their knowledge (Mariën and Prodnik, 2014). Internet experience again comes into play when it concerns the devices used to access the Internet. Thus, uptake and more advanced Internet usage may be significantly affected by prior Internet experience, giving those who start early an advantage in terms of benefitting from being online. Next to experience, the study suggests that the amount of time spent online matters, which is especially important when considering the Internet infrastructure limitations in Cuba. More intensive Internet use leads to better skills and a larger variety in Internet usage types, which suggests that those who are in privileged positions to experience high-level Internet access are also those who are most likely to benefit from Internet use and thereby strengthen their privileged position. The result is that when the Internet matures in Cuba, it is very likely that it will increasingly reflect the existing social, economic and cultural relationships that are present in the off-line world, including inequalities (e.g., Van Dijk, 2005; Witte and Mannon, 2010).

Limitations and future research

The main limitation of this study is its sample size. We consider this study to be a first exploration of the first- and second-level digital divides in Cuba. To date, only shallow indicators of Internet use, mainly access percentages, have been reported. Because performing research in Cuba is extremely difficult, we used snowball sampling. Furthermore, given the difficulty of obtaining a high-quality Internet connection, it was difficult to use the Internet for the survey itself.

It is both a limitation and a feature of this study that our data were conducted at one particular moment in time. Cuba stands on the threshold of potential dramatic changes, but these are hardly evident yet. The dynamic situation, however, provides sufficient argumentation to conduct follow-up studies on Internet use in the near future. The current study can be considered an exploration of the current situation in Cuba and a baseline of the first and second levels of the digital divide. Future research might even go one step further and focus on the actual effects of Internet use or the outcomes that people achieve. Adding more independent variables, such as migration rates and offshore family members, might shed more light on some of the findings.

Finally, more recently attention to the third level digital divide emerged, that is, the tangible outcomes of Internet use (Van Deursen and Helsper, 2015; Wei, *et al.*, 2011). Covering (a wide range of) outcomes in population studies is important if we want to get a thorough understanding of the broader picture of what the Internet contributes to everyday life (Van Deursen and Helsper, 2015). Future studies on Internet use in Cuba might further elaborate on who actually benefits from being online by including measures of the third level digital divide.



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