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IDENTIFYING THE RELATIONSHIP BETWEEN THE USE OF MOBILE TECHNOLOGIES AND TIME: A STUDY BASED ON A SAMPLE OF OECD MEMBER COUNTRIES

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Abstract: *There is no consensus in the academic community on whether modern technology positively impacts people's lives or, on the contrary, whether its use has more negative consequences. Given the universal nature of cell phones, the limitless possibilities of use, and their wide-ranging functionalities, it is reasonable to believe that these devices have been responsible for changing people's time management. However, different research approaches make it very difficult to confirm or reject hypotheses that consider associations between cell phone use and time use regarding the different activities in a unified way. This fact suggests that there is still a vast scope in research for further exploring and pursuing how technologies, their development, and their uses are able to permeate the everyday working and social life of the population. Based on this, the present paper aims to assess the relationship between the mobile communication device use and time-use change in a sample of Organisation for Economic Co-operation and Development (OECD) countries. This analysis used 3 cell phone use indicators and 12 time-bound indicators by using data for the year 2020. The most significant finding was the confirmation of the assumption arising from the application of regression analysis that the frequency of use of cell phones is not significantly related to the changes in the time structure. However, some significant relationships emerged in the models specified for women. This study also discovered that the most apparent difference was observed in unpaid and paid time throughout the day. The paper provides relevant findings which can be beneficial in many aspects. For example, in the business world, they can help manage business activities, improve performance measurement, or improve managerial decisions related to workflow optimization. The findings provide an understanding not only of the population's well-being but also of the ICT sector state and, ultimately, of all the characteristics of the sustainable development of the countries. In addition, the contribution of this study is also possible in designing more effective decisions by policymakers. In the article, we discuss the study's results, outline some practical implications, and suggest potential avenues for further research on this issue.*
Keywords: IC technologies, mobile broadband, OECD countries, sustainability, time use.
JEL Classification: M10, M20, M30

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Introduction. According to Goggin (2011), omnipresence and convergence are two significant (and helpful) features of present cell phone communication technologies. According to Klopfer and Squire (2008), smartphones have become a defining, if not normative (Floros, 2019) phenomenon of the digital era due to their capability to combine the following characteristics: portability, social interactivity, contextual sensitivity, connectivity, and personality. In addition, mobility brought along an exceptional and new consumption environment. Due to that, smartphones have become the first mass medium specific to a given place (so-called local medium) (Forman, 2013).

The popularity of these devices cannot be questioned. Cisco (2020) estimated that more than 70% of the Earth's population would have a cellular network connection by 2023, with the total number of global mobile users rising from 5.1 billion (66% of the population) in 2018 to 5.7 billion (71% of the population) by 2023. Further predictions suggest that in 2023 the number of global cell phones will increase from 8.8 billion in 2018 to 13.1 billion by 2023.

As smartphone functions are constantly expanding to support a variety of activities, it is now quite common for many human activities to be performed using a single device (Deng et al., 2019). In individual life, cell phones are not just used to communicate with others. Smartphones have achieved much higher utilization through various applications (Saidon et al., 2016).

There is no miracle that digital devices are so prominent in speeding up spatiotemporal compression, time pressure, or general mobility (Castells, 2010; Hassan, 2009; Rosa, 2013). The claim worth considering is that digital devices are accelerating the pace of everyday life (Wajcman, 2015). Some say that it is the result of the state of being connected all the time, of being always available, thus breaking the physical and time restrictions that once detached work from home and leisure (Mullan & Wajcman, 2019).

Others say that the cell phone, as a portable computing device equipped with a wireless connection and many applications, has changed how people manage their time management daily routines (Oulasvirta et al., 2012). In research, the way time is monitored is based on the concept of a consecutive «stream of episodes». Every part possesses its time length. The total time used is calculated by adding the sections to the equation. An individual's day and night are divided into the periods like paid work, work around the house (chores), leisure, and rest (Pantzar, 2010).

Experts in the field of time use research (Southerton, 2006; Michelson, 2005) suggest that it is high time to move from the notion of «the amount of time» to the notion of «the quality of time», especially the internal structure of time use, as the activities themselves seem to cause tensions, not the time spent doing them (Pantzar & Shove, 2010; Schatzki, 2009). At the same time, social theories of time explain how time is socially variable and how much it depends on time regimes and people's experiences (Adam, 1995). In addition, Peter Ducker argues that time is the most valuable thing, and people should manage it well because good time management reflects one's ability to manage other things.

As it turns out, smartphones have various characteristics, including portability and availability (Schrock, 2015). These influence users' smartphone checking habit – a quick check of the dynamic content immediately available on the device (Oulasvirta et al., 2012). However, some researchers (e.g., Pantzar, 2010) assume that checking smartphones has changed how people use their time and how they have adjusted their behavior at work, at home, and in their free time.

The enormous impact of mobile communication technologies on people's personal and professional lives has meant that many previous types of research have looked at the impact of smartphones on different segments of people's lives and their use of time. However, due to the different research approaches, it is very difficult to develop consistent scientific claims that would demonstrate clear positive or negative links between using cell phones and using time in terms of different activities. It means that there are still areas that need to be researched. Therefore, this paper's objective was to use statistical data available from the OECD database and evaluate the association between the use of mobile communication devices and the way people use their time in selected Organization for Economic Co-operation and Development (OECD) member countries. Information related to the time spent using mobile communication devices can help us better understand the population's well-being, the state of the ICT, and the social, economic, and environmental aspects of the country's sustainable development. In an effort to increase the competitiveness of individual economies, this information can also serve as an aid in making more effective policy-making decisions.

The presented paper is separated into five parts. The first part focuses on the theoretical background of the researched issues. The second part explains the methodological procedures and the materials used in the mathematical and statistical analysis. The third part of the paper deals with the results of these analyses. The results are then discussed. In conclusion, the paper outlines several practical implications and suggests potential opportunities for further research.

Literature Review. The use of cell phones around the world has increased pointedly in the last decade. Therefore, the impact of smartphones on human behavior and the time spent on these digital devices have also been researched. Previous studies point out that people experience time biases when using their mobile phones, which in turn may lead to information in questionnaires being distorted (Lin et al., 2015; Montag et al., 2015), various previous studies reported significantly different percentiles in terms of average time spent on electronic devices (Liebherr et al., 2020).

However, social scientists, medical psychologists, and ecologists point out that the diversion of humankind from the natural environment, the fast-paced and technology-oriented lifestyle resulting from the use of smartphones, is shaping consumer behavior and quality of life (Park et al., 2021). At the same time, scientists from various disciplines have become increasingly interested in the potential effects of smartphone use. More and more literature provides evidence of a negative relationship between the use of technology, including smartphone use, and health indicators. Researchers have studied the links between smartphone use and smartphone addiction and, for example, attention behind the wheel (Choudhary & Velaga, 2019; Kwon, 2013), sleep quality and quantity (Demirci et al., 2015; Bae, 2017; Ozkaya et al., 2020), anxiety, loneliness, and depression (Boumosleh & Jaalouk, 2017; Hong et al., 2012; Panova & Llearas, 2016), life satisfaction (Samaha & Hawi, 2016), but also attention-deficit/hyperactivity disorder (Ho et al., 2014; Han & Patterson, 2007).

However, other researchers have presented the beneficial effects of using smartphones. For example, Klimova and Valis (2018) suggest that smartphone applications, thanks to their independence of time and place, can help in the cognitive skills training of older individuals. Other researchers have found that smartphone applications focused on mental health can significantly improve the availability of treatment for people suffering from mental problems (Donker et al., 2013). Previous research has also looked at how smartphone use affects how people spend their time and their daily activities. For example, Furst et al. (2018) researched the association between excessive smartphone use and homework in college. They concluded that the time spent using a smartphone would otherwise be spent studying. Li and Lin (2017) researched the relationship between cell phone use and work performance. The dependence on these devices during working hours was also discussed in a study by Lanaj et al. (2014), Derks and Bakker (2014), or Perlow (2012). Liebherr (2020) examined cell phone usage based on various quantitative restrictions such as use period, frequency of use, applications used, and alerts received.

An intercultural study (Lopez-Fernandez et al., 2017), which included Generation Y participants from ten European countries, provided interesting findings. Research has shown that women place more emphasis on social interactions than men, which can lead to problems due to the increased use of mobile phones. The time spent using and engaging in cell phone-related activities (such as texting or phoning) could contribute to psychological dependence, especially in women.

However, research by Bianchi and Phillips (2005) found that cell phone use is sex neutral, yet the persistence of using mobile phones may differ in gender. Some researchers express that while men spend more time on their smartphones than women, women are more expected to browse social networks and instant messaging applications than men (Anshari et al., 2016; Bacík et al., 2018). Therefore, an investigation on disproportionate Internet use in young persons, i.e., in adolescents (Haug et al., 2015; Kuss et al., 2013b) as well as university students (Kuss et al., 2013a) indicated that the use of technology as such is not necessarily problematic, but frequent use of specific online applications, e.g., games (Kuss, 2013) or social networks (Haug et al., 2015; Kuss & Griffiths, 2017) may put these groups at risk of developing addiction (Jeong et al., 2016).

Another individuality related to the new consumption situation is online space's «pulsating» characteristics. McDaniel and Coyne (2016) state that each person's content consumption period is probably short in time, while the use frequency during the day is higher, practically obsessive (based on the no-mobile-phobia phenomenon). It is also significant to remind that content consumption on cell phones is frequently not an exclusive activity, and the person's attention in the hybrid space is, in most cases, separated between the screen and the perception of the current (McDaniel & Coyne, 2016).

Derks and Bakker (2012) note that the frequent use of smartphones also contributes directly to blurring the sharp line between work and leisure time. Spatial and temporal boundaries have become «fluid». The concepts of working time and leisure time are becoming increasingly difficult to grasp, social relationships and interactions have gained new meaning, and the dynamics of social engagement and leisure activities have also become increasingly multidimensional, taking place in physical, virtual, and perceived spaces (Herrschel & Dierwechter, 2018; Stefko et al., 2017).

Using smartphones at work is also a much-discussed issue. Some researchers argue that the influence of cell phones on the work position is a hotly debated issue. Some scholars argue that smartphones tremendously benefit the work position by supplementary internal and external communications and collaboration while enabling a flexible work structure and information sharing in real-time (Kossek & Lautsch, 2012; Lanaj et al., 2014). But some studies have shown that it is very difficult for employees who are strictly dependent on cell phones at work to disengage from their work and cell phones mentally, leading to thoughtful nervousness and work stress (Derks & Bakker, 2014; Perlow, 2012;).

Smartphones are constantly shaping consumer behavior in terms of leisure time (Bae, 2017). Leisure-time consumption with a cell phone as a fully developed companion affects independent well-being, moods, and feelings related to activities during the casual day. (Irimiás et al., 2021). Previous research has demonstrated that youngsters' leisure practices, experiences, and forms are mostly digitalized and often shown on digital platforms (Silk et al., 2016; Stefko et al., 2011). Physical activities like sports are also projected via smartphones to track and share success with the audience on social media platforms (Ehrlen, 2021). The leisure time of many is dominated by gaming, watching/creating videos, and scrolling social networks (Martínez-Sánchez et al., 2020). Activities such as reading have also moved to the digital world. Various fashion, travel, and entertainment journals are mostly read on cell phones (Wang et al., 2016). It is now common that information and communication technology, including smartphones, is present in each part of human life, with all its pros and cons (Nadolu & Nadolu, 2020).

Methodology and research methods. The presented study aims to evaluate the association between the use of mobile communication technologies and change in the use period (how one's time is spent) in selected OECD member countries. The research made use of two categories of data gathered from the selected OECD member countries entered, in particular, the use of mobile communication devices (OECDa, 2021) and time use (the way one’s time is spent) (OECDb, 2021). The countries were selected based on the intersection between the data in these areas, with 30 countries entering the sample: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Turkey, United Kingdom, United States, Estonia, Slovenia, Latvia, Lithuania. Some countries were not included in the Time Use database. Also, the Time Use database only provides data for the elapsed time period. The presented study made use of data for 2020.

As already mentioned, the research investigated the data on the use of mobile communication devices (3 indicators) and data on time use (12 indicators). The use of mobile communication devices presents the frequency of use in the dimension of broadband subscriptions and variables such as:

I. Data and voice mobile broadband subscriptions per 100 inhabitants (DATA_VOICE_M).
II. Data only mobile broadband subscriptions per 100 inhabitants (DATA_M).
III. Total_mobile_broadband_subscriptions_per_100_inhabitants (TOTAL_M).

The time use was categorized into three categories: Unpaid work, Personal care, Leisure, Paid work in terms of the total share, share specific for women, and share specifically for men. These were indicators:

1. Unpaid work TOTAL 15 – 64 years (UNPAID_T).
2. Unpaid work WOMEN 15 – 64 years (UNPAID_W).
3. Unpaid work MEN 15 – 64 years (UNPAID_M).
4. Personal care TOTAL 15 – 64 years (PERSONAL_T).
5. Personal care WOMEN 15 – 64 years (PERSONAL_W).
6. Personal care MEN 15 – 64 years (PERSONAL_M).
7. Leisure TOTAL 15 – 64 years (LEISURE_T).
8. Leisure WOMEN 15 – 64 years (LEISURE_W).
9. Leisure MEN 15 – 64 years (LEISURE_M).
10. Paid work or study TOTAL 15 – 64 years (PAID_T).
11. Paid work or study WOMEN 15 – 64 years (PAID_W).
12. Paid work or study MEN 15 – 64 years (PAID_M).

Statistical methods. The analytical processing made use of descriptive analysis methods: number of observations (count), arithmetic mean (mean), standard deviation (std), the lowest value in the set (min), 25th percentile - first quartile (25%), 50th percentile - median (50%), 75th percentile - third quartile (75%), the highest value in the set (max). The analytical processing also used inductive statistics: Ordinary Least Squares (OLS) linear regression analysis - a simple linear model. The suitability of the application of this method was verified using the Shapiro–Wilk test (normality) and Breusch – Pagan test (heteroskedasticity). The analytical

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processing made use of the following programming languages: R v. 4.1.1 and Python v. 3.9.6 in PyCharm (JetBrains s.r.o., Kavcí Hory Office Park, Praha 4, Czech Republic).

Results. The following section shows the outputs of analytical processes - the descriptive analysis and analysis of the relationship between selected mobile technologies and the use of time. The descriptive analysis shows selected indicators. The analysis of the relationship was carried out using simple linear regression points to relationships where its underlying role was to assess the significance of the relationships.

Table 1. Descriptive analysis

variables	count	mean	std	min	25%	50%	75%	max
DATA_VOICE_M	30	95.84	18.19	68.21	82.00	98.28	104.28	153.87
DATA_M	28	16.36	19.82	0.59	4.68	7.93	20.82	84.56
TOTAL_M	30	111.11	28.59	71.68	89.95	106.58	125.52	184.74
UNPAID_T	30	202.14	27.59	131.71	187.52	199.44	219.17	263.89
UNPAID_W	30	263.42	34.53	215.01	236.16	256.37	292.37	331.29
UNPAID_M	30	136.46	35.23	40.77	129.97	144.79	159.82	186.14
PERSONAL_T	30	658.40	30.13	608.91	637.56	654.35	680.65	752.25
PERSONAL_W	30	665.14	28.15	623.13	643.97	664.67	679.26	760.89
PERSONAL_M	30	651.55	33.07	594.73	630.53	643.68	676.61	742.96
LEISURE_T	30	295.97	37.34	171.93	279.50	297.27	320.13	368.24
LEISURE_W	30	274.86	38.91	159.11	260.35	276.04	298.92	365.85
LEISURE_M	30	318.28	37.77	186.60	298.11	315.05	343.87	375.39
PAID_T	30	266.96	45.28	176.71	237.75	260.93	294.64	362.65
PAID_W	30	217.72	40.93	133.12	196.01	207.67	246.47	288.47
PAID_M	30	317.81	61.96	220.81	273.85	310.81	350.90	478.33

Sources: developed by the authors.

Table 1 demonstrates the basic statistical attributes applied to the indicators entering the analytical processes. There were 30 observations for almost every indicator, the only exception being the DATA_M indicator, where 2 missing values were identified. The OECD database reports data on the time use only for the last year, i.e. a long time series could not be obtained from this database. This fact was perceived as a limitation. All indicators can be divided into two groups, namely mobile device usage indicators (first three rows of Table 1) and time use indicators. In the area of mobile technology use, the highest values were measured for TOTAL_M (mean = 111.11 ± 28.59) and, conversely, the lowest for DATA_M (mean = 16.36 ± 19.82). With regard to time use, the largest part was found in PERSONAL (mean: PERSONAL_T = 658.40 ± 30.13, PERSONAL_W = 665.14 ± 28.15, PERSONAL_M = 351.55 ± 33.07). In addition to the min and max characteristics, the position characteristics (25th, 50th, and 75th percentiles) are also displayed. Subsequent sections focused in more detail on the links between cell phone use and the way time is used.

In the next step of the analytical processing, a new variable was created with the working name Mobile Device Usage Index (MU index for short). The MU index indicator was created by averaging the standardized values of the DATA_VOICE_M, DATA_M, TOTAL_M indicators, while the input data formed values in individual countries. The MU index acquired values in the range from 0 to 1, where the theoretical value of 0 represents the lowest output of the listed indicators and, conversely, the highest. In the next step, the countries (observations) were divided according to the MU value of the MU index, and thus a new variable with categories <MED and> MED was created. This value entered the analysis, the output of which is presented in Figure 1.

Figure 1 specifies the time use variables on the horizontal axis and the time interval in minutes on the vertical axis. The horizontal lines in the visualizations show the position of the 25th, 50th (median), and 75th percentiles. From this, it was very easy to spot some important information. The first important information was that no major differences were found between the gender categories in all areas except UNPAID. Looking at UNPAID, this variable was dominated by women, while men dominated the variable PAID. The variable PERSONAL dominated across time use. Finally, it should be mentioned that there were no dominant differences between the median MU indexes, so it cannot be said that in countries where the use of mobile technologies is high, there are differences in time use compared to countries where the use of these technologies is lower.

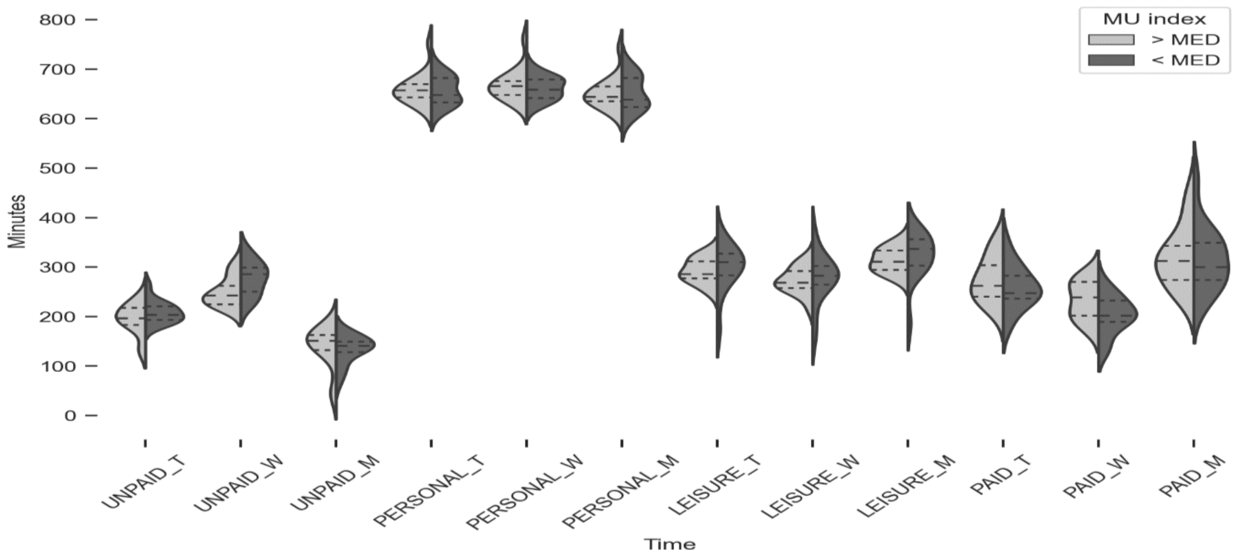

Figure 1. Comparison of time structure in MU index classification

Sources: developed by the authors.

The most important output of the study is shown in Table 2. Table 2 shows the outputs of the regression models. Before using OLS models, the underlying conditions were tested and assessed. The results are given in Annex 1. In most cases, the normality and constancy of residue variability were met. For models where these conditions are not met, the result should be perceived more carefully, mainly due to the versatility of the application, and thus the ability to compare coefficients with each other. The highlighted coefficients can be considered significant. The p-value itself was given in parentheses. The output of the regression models was organized into three groups: for the time used in the total population (Time TOTAL), women (Time WOMEN), and men (Time MEN). As can be seen, significant β coefficients were observed in only a few cases during the Time WOMEN (β (sig - p-value)) classification: DATA_VOICE_M -> UNPAID = -0.7 (0.044); DATA_M -> LEISURE = -0.46 (0.04); TOTAL_M - > PAID = 0.52 (0.047)). The results demonstrate that, overall, the use of mobile devices has nothing to do with the change in the time used during the day in selected OECD member countries. Some significant links were noted in the area of changes in time for women, but there was no significant proportion of coefficients perceived to be significant.

Table 2. Regression analysis output

OLS regression	Time TOTAL		Time WOMEN		Time MEN	
	α (sig)	β (sig)	α (sig)	β (sig)	α (sig)	β (sig)
DATA_VOICE_M -> UNPAID	223.3(0)	-0.22(0.443)	330.74(0)	-0.7(0.044)	94.74(0.011)	0.44(0.232)
DATA_M -> UNPAID	671.45(0)	-0.14(0.666)	662.21(0)	0.03(0.917)	681.8(0)	-0.32(0.359)
TOTAL_M -> UNPAID	257.07(0)	0.41(0.295)	223.72(0)	0.53(0.184)	293.46(0)	0.26(0.511)
DATA_VOICE_M -> PERSONAL	264.62(0)	0.02(0.959)	183.87(0)	0.35(0.408)	352.61(0)	-0.36(0.575)
DATA_M -> PERSONAL	208.99(0)	-0.41(0.136)	271.63(0)	-0.43(0.207)	140.43(0)	-0.3(0.397)
TOTAL_M -> PERSONAL	660.78(0)	-0.34(0.176)	667.55(0)	-0.36(0.096)	653.92(0)	-0.31(0.283)
DATA_VOICE_M -> LEISURE	297.5(0)	-0.07(0.865)	276.61(0)	-0.08(0.851)	319.23(0)	-0.03(0.933)
DATA_M -> LEISURE	256.88(0)	0.7(0.109)	204.63(0)	0.83(0.036)	311.57(0)	0.53(0.388)
TOTAL_M -> LEISURE	232.16(0)	-0.27(0.134)	314.12(0)	-0.46(0.04)	134.09(0)	0.02(0.928)
DATA_VOICE_M -> PAID	687.88(0)	-0.27(0.18)	689.25(0)	-0.22(0.242)	686.88(0)	-0.32(0.141)
DATA_M -> PAID	280(0)	0.14(0.563)	253.54(0)	0.19(0.457)	307.38(0)	0.1(0.697)
TOTAL_M -> PAID	227.66(0)	0.35(0.235)	159.63(0)	0.52(0.047)	302.43(0)	0.14(0.737)

Note: Sig = 0 means p-value < 0.001

Sources: developed by the authors.

Discussion. It has been found that the category PERSONAL, i.e., the time that the user devotes to personal care in addition to food and sleep, is dominant in the time used during the day. We could also include time spent on social networks in this category because, on these platforms, users are often interested in beauty, cosmetics, body care, physical health, etc. (Wang & Lee, 2021). In addition, men generally show more interest in technology, but women have a greater need to satisfy their social needs through mobile communication technologies (Kumar & Aruchelvan, 2018). And as women have been shown to spend more time on social networks (Andone et al., 2016) to express themselves, discuss their problems, and try to solve issues related to the different problems they face to achieve a more independent and stronger position in society (Morahan -Martin, 2004). Authors Taywade and Khubalkar (2019) point out that meeting these social needs in personal care by spending too much time on social networks can lead to dependence on mobile communication devices.

The research has also shown that in all areas except UNPAID, no large differences were found between the genders. However, these results are not unequivocally supported in research, although we must note that previous research has not addressed variables from the OECD database. However, we found agreement with the studies of Chen et al. (2017) and Kwon (2013), which, like our study, did not demonstrate any significant gender differences regarding smartphone use.

However, generalized findings from previous studies have shown gender disparities in access to technology and smartphone (Krithika & Vasantha, 2013; Lee et al., 2014; Van Deursen et al., 2015). Men are highly impacted by their personal attitudes to technology, while women are impacted by subjective norms and behavioral control (Venkatesh & Morris, 2000). Various other studies have reported that men use technology more than women and spend more time on computers, laptops, and smartphones than women (Chen et al., 2017; Lee & Kim, 2018;). However, there are also studies according to which women spend more time on mobile phones than men (Andone et al., 2016).

From the point of view of the UNPAID category, i.e. the time that users spend doing leisure activities (such as housework or shopping), it turned out that men dominated over women. Although some studies have reported that women are likely to use cell phones for online shopping (Hahn & Kim, 2013), research by Taywade and Khubalkar (2019) found that men are more likely to shop on smartphones because they do not like spending time in malls (Eriksson et al., 2018). Women are generally choosier and select to browse products in brick-and-mortar stores before buying them online. On the other hand, in the PAID category, i.e., time spent at work, men dominated over women. Thus, it seems that men's time on mobile communication devices can potentially signal lower labor productivity.

Finally, we can assess that there were no dominant differences between the median MU indexes. Therefore, it is not possible to unambiguously confirm that in countries where the use of mobile technologies is high, there are differences in time use compared to countries where the use of these technologies is lower.

Conclusions. The paper aims to evaluate the association between cell phone use and the change in time use in the selected OECD member countries. According to the results, it is generally impossible to say that the use of mobile communication technologies is related to changes in time use. However, this conclusion can be considered positive in terms of sustainability. Secondly, results for women are slightly different in terms of time use than those for men. The most obvious difference was found in the area of unpaid and paid time during the day. With regard to the association between time use and the use of mobile communication devices, attention should be paid to women as some important relationships have been confirmed in this group.

Although mobile communication technologies have been shown to have no significant relationship to time use, it is clear that these devices affect many aspects of our daily lives. It is believed that the present paper (analyses and results) has expanded the base of scientific knowledge related to the use of mobile communication devices.

Understanding the link between the use of time and mobile devices can benefit the business world. In the private sector, for example, traders are interested in when and how often people use different forms of media to run marketing campaigns more effectively or how time spent on these devices shapes the shopping patterns of the population (thus influencing consumer behavior). Information about time spent on mobile devices at work can help improve performance measurement or streamline workflow optimization. Data on time spent on mobile devices can also be used in proposing public policies, such as creating public transport systems or constructing public parks and facilities.

Knowledge related to the use of mobile communication technologies can also be beneficial in all aspects of sustainable development. From a social point of view, it is possible to talk, for example, about improving public health by taking measures to reduce the negative consequences of excessive use of mobile devices, especially of the younger population, or to increase the digital literacy and educational level of the population. From an economic point of view, investments in information and communication infrastructure, technological innovations, building a digital ecosystem, or increasing labor productivity could be considered. From an environmental point of view, we should pay attention to reducing the carbon footprint by switching to smart solutions based on mobile communication technologies.

The presented research has certain limitations. The biggest limitation is the frequency of sampling (n = 30). With a higher number of observations, it would be possible to make use of other regression methods and thus confirm or refute the results arrived at. Regarding the above, future research will focus on data security, where more sophisticated analyses could be performed. In particular, future research may include assessing the link between cell phone use and the change in time use at the microeconomic level. The research may include other countries (e.g., comparing developed countries with less developed ones) and more time panels.

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Вплив мобільних технологій на використання часу людей: дослідження в країнах Організації економічного співробітництва та розвитку

Ця стаття узагальнює аргументи та контраргументи в межах наукової дискусії з питання впливу цифрових технологій на життя населення. Систематизація літературних джерел та підходів до розв'язання наукової проблеми засвідчила, що сучасні технології можуть мати як позитивний, так і негативний вплив на якість життя людей. З огляду на універсальну природу мобільних телефонів, необмежені можливості використання та їх широкий функціонал можуть впливати на ефективний розподіл часу людей. Метою даної статті є оцінка зв’язку між використанням мобільних пристроїв та використанням часу людей на прикладі країн Організації економічного співробітництва та розвитку. У ході емпіричного аналізу було використано 3 індикатори використання мобільних телефонів та 12 показників використання часу. Отримані результати дослідження підтвердили гіпотезу, щодо незначного впливу частоти використання мобільних телефонів на зміни в структурі витрат часу людей. Однак, дана гіпотеза не була підтверджена у моделях для вибірки з жінок. За результатами дослідження встановлено найбільш помітні різниці між неоплачуваним та оплачуваним часом протягом дня. Результати дослідження мають практичне значення та можуть бути корисними в різних галузях, включаючи бізнес, управління, політику та сталий розвиток. У бізнесі вони можуть допомогти у розумінні факторів-впливу на продуктивність працівників та шляхи покращення ефективності робочих процесів. Наголошено, що управлінські рішення, пов'язані з оптимізацією робочого процесу, можуть бути прийняті на підставі отриманих даних про витрачений час. У політиці отримані висновки можуть бути використані для розробки більш ефективних рішень у сфері регулювання ринку праці та підтримки розвитку ІКТ-сектору. З огляду на важливість сталого розвитку, результати дослідження можуть бути використані для оцінки ступеня відповідності соціально-економічного розвитку до вимог сталого розвитку. Подальші дослідження сприятимуть розширенню наявних знань про вплив технологій на повсякденне життя та розвиток суспільства.

Ключові слова: ІКТ-технології, мобільний широкосмуговий зв'язок, країни ОЕСР, сталість, витрати часу.