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Harriet Taylor Mill-Institut für Ökonomie und Geschlechterforschung
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Expanding Capabilities through ICTs – A gender perspective on individuals' daily lives in the era of digitalization

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Abstract

This paper provides reflections on the expansion of individuals' capabilities through the use of information and communication technologies (ICTs). ICTs have been on the policy agenda for a considerable amount of time, and with the outbreak of the COVID-19 pandemic, they have become even more relevant for policymakers. Their diffusion in our daily lives inevitably has gendered aspects which the paper also points to. Theoretically, the discussion paper makes use of Amartya Sen's capability approach and focuses on the capability set which consists of two types of freedoms: well-being freedom and agency freedom (Keleher, 2007). For the operationalization of this framework, physical health and mental health are chosen as indicators for well-being freedom. To assess agency freedom, the paper makes use of the sociological concept of "conduct of daily life" and focuses on the changes in income-generating opportunities in the labour market and on educational chances as the main sources to conduct the daily life the way one wants to. In addition, to grasp the changes in the daily life and consequently interpret the effects of the use of ICTs on agency freedom, it deals with the temporal, spatial and social dimensions of daily life. Overall, the paper is part of the author's wider, evolving research agenda on gender and digitalization. Hence, the paper aims to engage with the existing literature on ICTs and their impact on individuals' capabilities and to gather as much existing evidence as possible to contribute to critical thinking on social transformation through digitalization and to gain insights on the under-researched areas.

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1. Introduction

A novel feature of the Agenda 2030 that in 2015 replaced the Millennium Development Goals is its emphasis on information and communication technologies (ICTs) to promote the empowerment of women and gender equality (UNDP, 2017). This is particularly evident in the Sustainable Development Goal (SDG) 5, "Achieve gender equality and empower all women and girls". SDG 5 includes the specific target "Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women" (UN Women, 2022). The only indicator for this target is the "proportion of individuals who own a mobile telephone, by sex" (UNSTATS, 2022). According to data from 2019, in 61 of the 85 countries that had available data more men than women own a mobile phone, whereas in 24 countries there is either gender parity or more women possess a mobile phone (ITU, 2021).

Yet, ICTs include more than owning a mobile phone., they encompass "all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form" (FAO, 2022).

In 2019, the International Telecommunication Union (ITU) noted that there was a significant gap between men and women in terms of access to technology and "that over half the total global female population (52 per cent) is still not using the Internet, compared to 42 per cent of all men" (ITU, 2019, n.p.). ITU further remarks that the only region of the world with a near-parity in the use of the internet is the Americas whereas in the rest of the world more men than women are online. In addition, Europe has the highest level of Internet use (82.5 percent) and Africa the lowest (28.2 percent).

The outbreak of the Covid-19 pandemic underlined the importance of ICTs and is expected to advance the digitalization process and the use of ICT in different areas of daily life even further. According to ITU, in 2020, at a global scale, 62% of all men and 57% of all women were Internet users (ITU, 2021a). Yet, ITU further notes that "[o]nly 19% of women in Least Developed Countries (LDCs) used the Internet in 2020, compared to 86 percent in developed world (in 2019)" (ITU, 2021b). According to the most recent data, the Americas has near-parity in using

the Internet (79 percent for the female population and 78 percent for the male population; in Europe the numbers are 83 percent vs 87 percent, in the Asia-Pacific region 54 percent vs 59 percent, in the Arab states 56 percent vs 68 percent, in Africa 24 percent vs 35 percent, and in the Commonwealth of Independent States 79 percent vs 81 percent for the female and male population respectively; ITU, 2021a).

In other words, ICTs become increasingly a part of individuals' daily lives – yet especially of men in industrialized countries. Even more, it is one of the global development goals *to make* ICTs part of everyone's daily life. Consequently, closing the digital divide between men and women, i.e. the gap between men and women in accessing information and communication technologies, is an important goal for policymakers across the globe (ITU, 2021b).

Against this background, this paper approaches the impact of the use of information and communication technologies on individuals' chances to lead the lives they want to pursue – in line with the main idea of Amartya Sen's capability approach (e.g. Sen, 1992, 2001). In doing so, the paper also pays attention to gendered differences in these chances and sheds light on two key aspects. First, the paper looks at *i)* how the use of information and communication technologies can expand the individuals' capability set. The expansion of the capability set is here understood as the main indicator for social progress (see also Sen, 2001; Keleher, 2017; Güney-Frahm, 2021). Second, the paper also aims at examining the potential changes in the capability set from a gender perspective and therefore demonstrates how the ICT-based changes impact men and women's lives differently. The gender perspective herein seeks "to focus on the change in women's life situation and societal positioning as well as the change in political, economic, social and cultural structures and processes that produce women's subordination" (Thiessen, 2008, p. 38, translated by the author). It is important to note that this focus does not ignore the complexity of inequality and that women can also discriminate against other women, neither does the paper deny that sex and gender themselves are social constructs that primarily rely on heteronormativity. Alas, it is impossible to deal with the impact of digitalization on LGBTIQ+'s daily lives within the scope of this discussion paper.

Theoretically, the discussion herein rests upon Amartya Sen's Capability Approach and Sen's idea that social progress is to be measured by the expansion of the

capability set (e.g. Sen, 1992, 2001; Keleher, 2007). Methodologically, it makes use of the existing literature at a global scale with evidence and case studies from a wide range of countries. The literature is examined to gather as much evidence as possible. The paper acknowledges that there are regional cultural, economic and technological differences with respect to access and use of ICTs. However, the primary goal of this paper is not to provide a comprehensive review but rather to approach certain ideas or topics that are emerging from the very large field of ICT and that are to be addressed in the future in thematically and regionally more narrowly defined research projects. Moreover, the current state of research in many fields and regions is severely underdeveloped and therefore renders a substantial comparative analysis impossible.

2. Theoretical and Operational Framework1

The Capability Approach is the theoretical foundation of the UN's Human Development programme. It is used in a variety of academic and policy-related contexts to evaluate the impact of public policies or to design community-based projects for empowerment of vulnerable groups including women (Comim et al. 2010; Robeyns, 2003, 2005, see also Güney-Frahm, 2017). Since the late 1990s, there has been a growing interest in applying the capability approach to the use of ICT in development projects and to assess their empowering effects (Osterlaken & Den Hoven, 2011, p. 65; see also Birdsall, 2011; Coeckelbergh, 2011; Loh 2015, Toboso, 2011; Smith et al 2011, see also Güney-Frahm 2018, cp. Egesse et al. 2018, Kleine 2011; Dasuki et al. 2014). However, it is important to note that the capability approach is a framework that is open to different interpretations (e.g. Comim et al. 2010) and needs to be supported by different theoretical perspectives (Egessa et al. , 2018; Kleine, 2011).

Moreover, access to and use of the ICTs are not the ultimate end in themselves (Zheng, 2009). Following Zheng (2009), I understand ICTs as a medium to promote human development (Zheng, 2009, pp. 78-79) and gender equality. Theoretically, the paper operationalizes Sen's ideas with the help of sociological

[1] This section primarily stems from Güney-Frahm (2021) where a Capability Approach-based model to evaluate the pandemic from a gender perspective is proposed (see also Güney-Frahm, 2013, 2017, 2018). Here a slightly modified version is presented.

concepts that provide analytical access to individuals' daily lives and that have already been employed elsewhere (Güney-Frahm, 2021). Above all, the argument herein is based upon the contention that social progress is to be measured by the expansion of individuals' capability set (Sen, 2001; see also Keleher, 2007). In Sen's terminology, the capability set consists of all freedoms a person can have (Sen, 2001). Following Keleher (2007), those freedoms, i.e. the capability set, can be defined via two components that encompass all other freedoms: well-being freedom and agency freedom. Well-being freedom "is one's freedom to achieve those things that are constitutive of one's well-being" (Sen, 1992, p. 57). Agency freedom "is one's freedom to bring about the achievements one values and which one attempts to produce" (Sen, 1992, p. 57). Agency refers to "the ability to define one's goals and act upon them" (Kabeer, 1999, p. 438).

In order to operationalize this framework, physical health and mental health are chosen as indicators for well-being freedom (Güney-Frahm, 2021) and the paper focuses on the questions: *i) how can the use of ICTs affect physical and mental health?* and *ii) how can ICTs be employed to promote physical and mental health?* Second, to assess the ICTs' potential impact on agency freedom, the paper makes use of the sociological concept of "conduct of daily life" ("Alltägliche Lebensführung"). Conduct of daily life refers to the "whole arrangement of different life practices a person exercises every day in different spheres of his or her life" (Diezinger, 2008, p. 221, translated by Güney-Frahm, 2013, p. 9). The daily life consists of three interrelated dimensions, these are space, time and social relations (Täubig, 2009). The underlying reasoning to focus on the conduct of daily life is that if someone possesses agency freedom, he or she can organize their daily life in a manner he or she wants to (Güney-Frahm, 2021, 2017, 2013; see also Leßmann 2006, p. 34). Finally, income and education are considered as the two most important resources that enable individuals to organize these three dimensions in their daily lives (Güney-Frahm, 2021, cp. Bourdieu 1983). Given this framework to assess agency freedom, the analysis looks at the questions: i) to what extent does digitalization provide access to educational and economic opportunities? and ii) to what extent does digitalization grant individuals the freedom to design the spatial, temporal and social organization of their daily lives? While dealing with these two questions, we will first show digitalization's general effects and then highlight the gendered aspects.

3. Well-Being Freedom and ICTs in Everyday Life

Based on the assumption that well-being freedom is one of the two key components of the capability set, this section deals with the increased use of ICTs and its impact on one's well-being. Individuals' physical and mental health are chosen as the indicators to demonstrate one's well-being (see also Güney-Frahm, 2021). Scholars' views on the impact of ICTs on individuals' well-being, i.e. their physical and mental health are contentious. In a review of different expert opinions, Anderson and Rainie (2018, p. 30) write that in their study nearly a third of the interviewed experts share the opinion that negative aspects of digitalization will outweigh the positive ones when it comes to individuals' well-being and happiness. On the other hand, there are also many scholars who highlight the opportunities associated with ICTs to promote physical and mental health. The following sections dig deeper into these concerns by separately discussing findings for ICTs' impact first on physical health and secondly their impact on mental health.

3.1 ICTs and Physical Health

With respect to physical health, there are emerging research questions related to remote surgery and use of artificial intelligence in health services (Perretta, 2021). However, the existing literature from a wide range of countries mainly focuses on the risks of the increased use of ICTs due to less physical activity and on the benefits of telemedicine in particular for maternal health.

ICTs may indeed increase the risk of chronic diseases which is why many scholars from various backgrounds warn against the negative effects of the use of ICTs in individuals' daily lives regardless of their sex. Dominic et al. (2018) find in their empirical study from Nigeria that "ICT use encourages deviation from a physically active lifestyle and might surreptitiously become a contemporary contributor to chronic diseases" (p. 5). They conclude that the excessive use of ICTs can increase the risk of cardiometabolic, cardiovascular and physiological as well as mental problems (Dominic et al., 2018, p.12). In a similar vein and based upon a study from Australia, Palmer et al. (2014, pp. 170-171) point out that ICTs lead to deteriorating physical health as exposure to ICT is associated with musculoskeletal disorders. Similarly, in their study on Finnish youth, Punamäki et al (2007) highlight that "intensive ICT-usage was associated with poor perceived health

particularly or only when it negatively affected sleeping habits, which in turn was associated with increased waking-time tiredness" (p. 569). Whereas these works from different regions of the world echo the growing concerns about the increased use of ICTs, ICTs can also be employed in a way that promotes physical health.

As Honka et al. (2011) observe, ICT-based services can support a healthy lifestyle and incite behavioral changes through monitoring in digitalized systems. Tools like fitness apps, footstep trackers or sleep pattern apps can increase individuals' willingness for self-care. For instance, while comprehensive studies of the pandemic's impact on physical health and on the mitigating or exacerbating role of ICTs in the process have yet to come out, there is a wealth of anecdotal and journalistic material and new research that points yet again to diverging outcomes. On the one end of the spectrum, some individuals have taken the opportunity of additional time spent at home to dedicate themselves to improved fitness (Reynolds, 2020; Kaur et al., 2020). On the other hand, some individuals developed an even more sedentary lifestyle with more unhealthy eating habits and less physical activity than prior to the pandemic (Christensen et al,. 2022; Diaz, 2022) .

Online programs ranging from exercise videos to dietary plans and online consultancy offered by regular doctors that seek to minimize their and their patients' exposure to infection risks have led to a marked improvement in physical health for a certain subsection of society. Here, it is noteworthy that using such services requires a certain amount of time. The available empirical evidence to date suggests that women and especially mothers across different world regions have had to shoulder an increased workload, among other reasons due to school closures. Bünning and Hipp (2021) for instance demonstrate that during the pandemic the decrease in women's, especially mothers' life satisfaction in Germany has been higher than the decrease for men. In a report on the gendered impacts of the pandemic in Europe and Central Asia, UN Women (2020, p. 24) finds that 43% of the surveyed women spend more time for cooking compared to their pre-pandemic lives whereas this number is only 16% for men (see also Güney-Frahm 2021, p. 409). Therefore, it can be argued that compared to men many women from various countries presumably struggled to find the time to follow online exercise courses.

Nevertheless, ICTs can support health promotion on a very fundamental level as they can enable access to health services in contexts where this would have otherwise not or not as easily been available. ICTs and telemedicine increase hopes with respect to access to health care services in developing countries (Shiferaw and Zolfo, 2012, p. 1). Based on findings from Ghana, Awotwi (2012) highlights that ICTs can enable "quick, timely high quality affordable healthcare for all, everywhere, at any time; overcomes shortage of healthcare staff and funding and optimization of patient care" (p. 376; see also Preko & Boateng, 2020).

From a gender perspective, telemedicine can be particularly valuable. Despite some level of progress, women still have limited access to health services worldwide, and in developing countries their access is even more limited (WEF, 2021; UN, n.d.). Therefore, provided that women have access to them, ICTs can play a vital role to expand women's well-being freedom by promoting their physical health, especially in the Global South. The empirical evidence on the application of ICTs in maternal health care services illustrates this potential particularly well (e.g. Macrohon et al., 2019). In a study from Nigeria, Obasola and Mabawanku (2018) show that pregnant women considered maternal and child health care information disseminated by mobile phones as useful or very useful. Furthermore, Obasola et al. (2015) note that digitalized health services have a positive effect on maternal and child health in Sub-Saharan Africa.

Yet, as Waldman and Stevens (2015) criticize, most of the ICT-based projects in the health sector focus on maternal health care and ignore more contentious issues like "reproductive justice, health rights and adolescent sexual pleasure" (Waldman & Stevens, 2015, p. 34). ICTs must be used in health promotion in these areas as well in order not to reproduce gender stereotypes and to not falsely equate women with mothers. Nevertheless, these studies illustrate that especially in developing countries, the application of ICTs to health services and telemedicine can be lifesaving for women.

There are more benefits of telemedicine for women, as pointed out by Perretta (2021), CEO of AXA Europe and Latin America: "Virtual consultations put certain kinds of house calls within reach of many consumers, reducing the need to arrange childcare and elder care before making a doctor's appointment. […] moving health services online can make life easier for female health service professionals as well, as work-from-home possibilities grow". Telemedecine can be an effective way to

cut costs in the provision of healthcare while not necessarily maintaining the same standards of care, hence it should not be surprising that insurance companies like AXA welcome it. One should also remember that for elderly people and others that struggle with digital access and technologies, telemedicine services can be difficult to attend. Yet, these critical aspects do not change the conclusion that telemedicine can be a cost-saving and time-saving way to access health services and given that women and especially mothers have less time compared to men it can improve many women's lives.

The pandemic accelerated the use of telemedicine services worldwide, and it is expected that these services will remain popular (e.g. Bestsenny et al., 2021). According to data from STATISTA, Spain holds first place in Europe, as more than 70% of the Spanish population uses telemedicine services between April 2020 and March 2021, and it is followed by Slovenia (65,4%) and Poland (61,9%) whereas Germany (23,3%) and France (23,2%) come in last (Stewart, 2022). Thus, following Perretta (2021), it can be argued that "at least one positive thing for women may be coming out of the pandemic: the rapid digitalization of medicine" (n.A). However, it is important to remember that digitalization can result in new inequalities or deepen existing ones. An intersectional perspective is indispensable. For older women, for example, access to telemedicine is far more limited than for men. For countries like Germany or France that lag behind in digitalization, it is important to catch up to promote an inclusive health system and gender equality. Nevertheless, in order to do this, it remains essential to ensure equal access to new technologies.

3.2 ICTs and Mental Health

The second indicator of changes in one's well-being is mental health. As in the case of physical health, views on the link between ICTs and mental health are divided. In addition to physical health risks, which are mentioned above, there are mental health risks associated with the use of ICTs. Based upon a review of the literature, Dragano and Lunau (2020) point to the risk that digitalization increases work-related stress which in turn may lead to mental health problems. In an empirical study from Hong Kong and Australia, Ninaus et al. (2015) similarly conclude "that ICTs are an additional source of work stress" (p. 5). Several countries like Portugal, the Philippines and Italy have therefore changed working regulations and banned

the obligation for workers to be available for their employers outside working hours (Matei, 2021). From a gender perspective, having reliable and pre-determined working hours and a separation between the different spheres of life can play a vital role in reducing stress and promoting mental health because women have more problems with the work-life balance given the amount of unpaid work they perform in both Global North and South (e.g. EIGE, 2020, pp. 44-48; Güney-Frahm, 2020a, 2020b, 2021).

On the other hand, ICTs and access to the digital world can also have a positive impact on one's mental health. For example, after a review of the available literature on children's mental well-being, Kardefelt-Winther (2017) emphasizes the importance of a differentiated view on ICTs' impact on mental health. According to him, a "moderate use of digital technology tends to be beneficial for children's mental well-being, while no use or too much use can have a small negative impact" (Kardefelt-Winther, 2017, p. 6). Similarly, Kardefelt-Winther et al. (2020) find in a study on the internet use of children in four countries "that higher-frequency Internet use was only weakly associated with lower mental health in two countries (Bulgaria and Chile) and that this pattern did not hold in two others (Ghana and the Philippines)" (p. 888).

Not only for children but also for adults, internet use can have benefits for their mental well-being and life satisfaction. In a study on Israel, Lissitsa and Chachashvili-Bolotin (2016) state "that internet adoption and digital uses increase life satisfaction, after controlling for socio-demographic variables, sociability and health condition. In addition, internet adoption and digital uses can constitute an important channel for increasing life satisfaction among senior citizens and weaker social groups" (p. 197). Echoing this finding, Penard et al. (2013) claim that in Luxembourg, "non users are less satisfied in their life than Internet users. Moreover, the positive influence of Internet use is stronger for individuals who are young or not satisfied with their income" (p. 1).

Internet use enables individuals to maintain their social relations and in case of developed countries it has almost become a social norm (Lissitsa & Chachashvili-Bolotin, 2016, p. 198; Penard et al., 2013, p. 3). An OECD report (2018, p. 8) on digitalization and young people's mental health likewise highlights that ICTs can foster social inclusion and a sense of belonging which in turn have positive impacts on mental health. Although with the pandemic there is evidence that online

relationships cannot be a substitute for face-to-face relations in trying to avoid social isolation and foster social belonging (AIHW, 2021), it was thanks to technological advances that individuals could continue their social relations during the lockdowns (Criddle, 2020; see also AIHW, 2021; IOM, 2020).

Similarly, in the Global South, too, internet usage is increasing (Silver, 2019). Silver (2019, n.p.) notes that in 2014 "less than half of the Mexican public (45%) and only about a third of Filipinos (34%) used the internet at least occasionally or owned a smartphone. Today, internet use in these countries stands at 73% and 66%, respectively". Between 2013 and 2018, the median of smartphone ownership in emerging economies (India, Indonesia, Philippines, Kenya, Nigeria, South Africa, Brazil and Mexico) rose from 18% to 47% (Silver, 2019). Yet, there are also substantial discrepancies between countries in the Global South. When it comes to the least developed countries, 75% of the population still has no access to the internet (ITU, 2021c).

According to the World Bank (2022), "about 35 percent of the population in developing countries has access to the Internet (versus about 80 percent in advanced economies)". Hence, internet usage in the developing world is a standard that fewer people are able to attain and there is an imbalance between men and women in its use. This makes it a crucial challenge to close the digital divide between men and women as well as between developed and developing countries.

Moreover, ICTs can also increase people's opportunities to access mental health services (van der Krieke, 2014). In a comparative analysis of Australia and the USA with the aim to find recommendations for the UK, Cotton (2019) argues that ICTs offer an important, low-cost opportunity to provide mental health care to those who do not have access to those services. From a gender perspective, these are particularly valuable developments as the evidence so far suggests that women are at an increased risk of suffering from mental health problems (Mental Health Foundation, 2021.; WHO, n.d.). In addition, access to online mental health services is time-saving, which is particularly important for women who often juggle both paid and unpaid work (Perretta 2021).

Crucially, access to mental health care is going to play a vital role in the coming years given the pandemic's impact on individuals' well-being. Frederiksen et al. (2021) find that although women's mental health was more adversely affected due to the pandemic, "relatively few have reported seeking mental health care"

(Frederiksen et al., 2021, n.p.), which is why they highlight the importance of access to mental health services. There is anecdotal evidence that online therapies have helped women to deal with the increased stress during the pandemic (Verstraete, n.d.) while self-care apps specifically designed for women may also decrease their risks of mental health problems (Rawlings, 2021).

Finally, monitoring of individuals' health, both physical and mental, via digitalized services as well as the use of the ICT in health promotion risk breaches of personal data protection – a risk inherent to all ICT-based health services as also highlighted by Al Dahdah et al. (2015; see also Güney-Frahm, 2018, p. 34.) The Covid-19 pandemic has underlined how crucial data protection is. The tension between protection of individual data and ensuring public health caused many countries not to use digitalized services. In Germany, for example, the use of fax machines to track infected people's social contacts slowed down the fight against the spread of the virus (Heller, 2021). On the other hand, countries like Israel that relied on digital monitoring systems were more successful in mitigating the effects of the pandemic (Shwartz Altshuler & Aridor Hershkowitz, 2020). Given that women have been "at the core of the fight against Covid-19 crisis" (OECD, 2020), digitalized health services and in particular monitoring during such an extraordinary period of time would have helped to reduce their burden.

Yet again, from a critical perspective, monitoring one's health through ICT-based applications is also a form of governmentality in Foucauldian terms. The governmentality over an individual's health can also be found in other technology-driven areas. For example, the idealized bodily image for women puts even new mothers (especially middle-class women) under pressure to return to their pre-baby bodies in the fastest manner possible (Güney-Frahm, 2020b). The OECD (2018, p. 9) similarly emphasizes that the increased use of social media and its importance can lead to eating disorders, especially for young women (see also BMFSFJ, 2021).

4. Agency Freedom and ICTs

Based upon the assumption that agency freedom is to be found in the individual's daily life, this section looks at how the ICTs can impact the organization of the three dimensions of daily life (temporal, spatial and social) and the two resources income and education. The leading questions in this section are i) which

opportunities do information and communication technologies provide in terms of expanding educational and financial resources?, and ii) which impact do ICTs have on individuals' freedom to design the spatial, temporal and social organization of their daily lives? While digging deeper into these questions, the paper will employ a gender perspective that particularly focuses on challenges and opportunities for women.

4.1 ICTs and Resources

Access to both of the two chosen key resources – income and education – is globally gendered and more limited for women (e.g. UN, n.d.; see also WEF, 2021). The labour force participation rate for the world's female population is approximately 47%, for the world's male population it is 72% (ILO, 2022). With respect to education, UNICEF (2022, n.p) notes that "more than two-thirds of countries have reached gender parity […] in enrolment in primary education, but in countries that have not reached parity, particularly in Africa, the Middle East and South Asia, girls are more likely to be disadvantaged than boys".

There is widespread agreement that ICTs can foster learning opportunities, and women's access to formal and non-formal education and training can in turn significantly contribute to gender equality and women's empowerment (Güney-Frahm, 2018, pp. 134-135). Moreover, ICTs can enable women to balance their care work with their educational aspirations (Msoffe, 2016). In addition, there are programmes that specifically target women. The initiative 'Girls Excelling in Math and Science' for instance, brings female professionals as mentors together with secondary school girls (The Earth Institute of Columbia University & Ericsson, 2016, p. 55; see also Purdue University, 2019; Güney-Frahm 2018). The ILO for its part provides online training as well as scholarships to women in technological education including web and game development in the Philippines (UNICEF & ITU, 2020, p. 10; ILO, n.d.).

Such trainings to change mindsets are particularly important to challenge gender stereotypes and cultural norms. However, online programs can also reproduce gender stereotypes in their learning material (Yeasmin et al., 2012) – as is true for any kind of educational program. A noteworthy aspect about online trainings concerns the courses that target employees. If such courses are offered to a certain group of individuals, for example to those in top positions, it is very unlikely

that a lot of women can attend these trainings as they are underrepresented in those positions (BMFSFJ, 2021, p. 92).[2] Moreover, for women with care-related duties, in particular for mothers it is more difficult to take part in educational programs as their time is more restricted. Hence, online trainings should be flexible and easily accessible to enable individuals to design their schedule as they wish.

Yet, ICTs can also increase women's economic opportunities directly as they impact their opportunities on the labour market (see also EIGE, 2020). First, they can expand women's access to financial services and promote their entrepreneurial activities through online banking services or business training (The Earth Institute of Columbia University & Ericsson, 2016, pp. 32–45). In addition, ICTs can create new business opportunities as in the case of e-commerce, "the buying and selling of goods or services via the internet, and the transfer of money and data to complete the sales" (Future of Commerce, 2020). E-commerce may provide an important opportunity for women to participate in the labour market by circumventing social pressures against women who work outside of their household or by enabling them to stay at home and perform their household-related work (Razak & Pisal, 2016). On the other hand, in this manner traditional gender roles persist, internalized inequality remains unquestioned, and the risks of reinforcing gender inequality are exacerbated (Güney-Frahm, 2018).

The reproduction of gender inequality through new income-generating opportunities in the era of digitalization is a problem which exists not only in the Global South but also in the Global North. Especially in the case of platform workers, precarious and stereotype-based working conditions persist so that the access to the labour market, which is made possible by the use of ICT, takes place in a manner that reproduces the marginalization of certain groups of individuals, in particular of women and migrants (BMFSFJ, 2021, pp. 124-140; EIGE, 2020, pp. 89-105). In sum, there are certain risks associated with ICTs such as reproducing gender inequality and especially in terms of internalized structures which restrict agency freedom. On the other hand, if women can have access to them at all, the ICTs can mean new opportunities for women to lead the life women want to lead due to increased access to education and income generating opportunities. This is however not to say that access to them is sufficient; the use

[2] The assumption that there could be a trickle down of knowledge by offering courses to the leadership level in companies and organizations is misguided since women are severely underrepresented in these positions both in the developed and in the developing world

of these new opportunities is not equally distributed. As the Federal German Government`s Third Gender Equality demonstrates (BMFSFJ, 2021) there are significant barriers to female entrepreneurs in the ICT sector, ranging from finding a credit to care-related duties whereas this does not hold true for male entrepreneurs.

4.2 ICTs and Organization of the Daily Life

The next analytical step deals with the organization of the daily life and to what extent the increased use of ICTs can expand individuals' freedom in the dimensions of social relations, time and space from a gender perspective. With respect to social relations, ICTs have an impact on human beings' perception of socialization. They offer an alternative way of connecting with people which comes with both risks and opportunities. The socialization via technology can result in isolation, however it can also foster a sense of social belonging (see also Marlowe et al., 2017). New communication technologies and social media allow special interest groups to connect in ways that were impossible but a few years ago. And this holds especially for marginalized groups like LGBTIQ that were and, in many places, still are excluded from public off-line socialization. From a gender perspective, these developments can mean an increased participation in public life for women. As El Asmar (2021) from Oxfam notes, ICTs offer new opportunities to form solidaristic movements as they provide "an alternative space for discussions, mutual learning and support, as well as solidarity and resistance through garnering collective power" (p. 14). At the same time, such online groups and exchanges via social media can also be a medium to reinforce traditional gender roles which is particularly evident in the case of parenting networks (Güney-Frahm, 2020b; Madge & O'Connor, 2006). Verniers et al. (2022) analyze French mothers' blogs and conclude that the "intensive parenting" practices shown and promoted in these blogs are informed by an ideological tangent that disadvantages women "including the sacredness of home, need for balance, and the praise of fathers. Furthermore, mommy blogs, as public online diaries involving everyday experience, prompt mothers to confess their failure to comply with intensive mothering demands and, at the same time, to reaffirm their commitment to its principles" (Verniers et. al., 2022, p. 1).

An entirely new aspect in social relations in the age of digitalization concerns cyber-bullying which affects women and young girls more than the male population

(EIGE, 2020, pp. 63-64; BMFSFJ, 2021, pp. 197-211). Pew Research finds that in the U.S. 15% of teenage girls were targeted by cyber-bullying methods whereas this number was 6% for boys (Anderson, 2018). Germany's Third Gender Equality Report highlights the risks of the increased use of ICTs at work due to cyber harassment, spy-apps, fake profiles or the unauthorized use of intimate pictures or videos of women (BMFSFJ, 2021, pp. 197-211). These experiences endanger both physical health and, due to the increased psychological burden, also women's and girls' mental health (BMFSFJ, 2021).

Another dimension of the daily life we consider is its spatial organization. The online world itself is a contested space and, given the digital divide, access to this space is gendered (Dixon et al., 2014). While it is important to reduce the digital gap, it is also noteworthy that digitalization and ICTs can reproduce traditional, gender-based organization of the space such that women are confined within the boundaries of domestic space. For instance, the application of ICTs in a wide range of areas of public space bear the risk that women become less visible in the offline public space and are consigned to the domestic sphere. Opportunities that are associated with e-government services, home office or distance learning also mean being less visible outside the home (Güney-Frahm, 2018) – as amply demonstrated by the Covid-19 pandemic (see also Güney-Frahm, 2021).

Finally, ICTs are related to a new way of time management. A critical aspect regarding time management is that individuals can be addicted to the Internet or be distracted by the online content they follow so that they do not devote their time to family, work or friends even if they are physically present with them. With technology and increased flexibility, it also becomes more difficult to categorize time as working time, family time etc. Especially for women, who do more unpaid work, the distinctions between these spheres become ever more blurred and therefore more challenging. A very good example of the changing nature of the time-space relationship is working in the home office on which evidence from both Global North and South increasingly becomes available (Güney-Frahm, 2020a, 2021). Home office is an option that is particularly relevant for white-collar workers worldwide, therefore it inherently has class and educational biases. Nevertheless, home office may mean an increased work burden for women as it pushes the limits of women's time (for an overview of the existing literature see Güney-Frahm, 2020a, pp- 40-42). Women and in particular mothers may have no other option

but to perform household work parallel to their paid work. They are being interrupted more during working hours and may be excluded from workplace relations and dynamics that are important for progressing in their careers (Güney-Frahm, 2020a). The pandemic has underlined these findings. Even if the amount of care work has increased for both sexes during their time in the home office, Bünning and Hipp (2021) demonstrate (see also BMFSFJ, 2021) that the burden on women's shoulders in Germany is still higher; this finding holds in a great number of countries both in the Global North and Global South (UN Women, 2020). Against this background, it can be argued that the ICT-determined temporal organization of daily life and the blurring distinction between working time and private time is more problematic for women.

5. For better or worse? ICTs and individuals' daily lives – Concluding Discussion and Outlook

The engagement with the literature shows that the ICTs have ambiguous effects on individuals' conduct of their daily lives. With respect to well-being, ICTs can make valuable contributions to the promotion of physical and mental health especially of women because they provide an expanded level of access to health services which are more limited for women in some countries. However, ICTs can also affect physical and mental health adversely regardless of sex. Moreover, the exposure to social media, digital violence or the additional stress at work due to the increased use of ICT can have more significant and negative impacts on women's health and well-being.

In a similar vein, the increased use of ICTs can have both positive and negative effects on women's agency freedom. The ICTs have the potential to increase the resources for the scope of action in one's daily life, i.e. in particular through educational and economic opportunities. Yet, there is a significant need for studies that investigate this potential and demonstrate their gender-related, regional, class- or ethnicity-based dimensions. Furthermore, experiences from both the Global North and Global South demonstrate that there are certain risks associated with these opportunities from a gender perspective. The same holds true for the spatial, temporal and social organization of daily life. Although the ICTs offer flexibility in terms of the temporal and spatial organization and a new channel for social relations, they may reinforce gender stereotypes and traditional roles.

At this point, it is not possible to conclude whether the positive effects will outweigh the negative ones or vice versa and under which circumstances ICTs definitely contribute to gender equality. The digitalization process should be understood as a type of social change that takes places at three levels: at the societal, community, and individual level (Güney-Frahm 2022). Hence, the associated changes will be dependent on the structural inequalities in society, the reproduction of these inequalities in the daily interactions as well as on the internalization of these factors by the individuals. Hence, without tackling the already existing inequalities, ICTs cannot change much for the better or can even have adverse impacts as evident in the case of the reproduction and diffusion of traditional gender roles in parenting blogs. For future research it will be essential to work out thoroughly the circumstances under which women have gained capabilities through ICT use and to determine which factors or applications of ICTs have a positive effect and which ones have a negative effect on women's well-being and agency freedom.

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