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Negotiating digital spaces in everyday life: A case study of Indian women and their digital use by Anindita Paul and Kim M. Thompson

Abstract

New developments in digital technology and better and affordable access allow women unprecedented access to information and communication networks — if they are able to use digital technologies to access networks and digital information. This study presents a case study of motivations of women to use information and communication technologies (ICT) in a ubiquitous information environment. This study follows an interpretive paradigm to explore an understanding of culture and gender in a middle-class Indian context. Women in this report varied in terms of heavy/light and mandatory/voluntary use. We discuss the implications of such variations in terms of technology adoption for digital inclusion. Social factors, such as the role of parents and social communities, were found to influence women to develop and maintain interests in ICT that were reflected in their professional and personal lives. Some women were slow to adapt to ICT use as they tended to adhere to normative expectations which hindered ICT use. Women tend to have greater ICT use if it is for fulfilling familial roles and for communication.

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Introduction

In the past several years we have seen a wave of digital initiatives in South Asia acknowledging the social role and transformative power of electronic media. India and other countries have been launching digital initiative programs in an attempt to ensure social and digital inclusion in their societies and communities. At the end of 2015 the Indian government launched its “Digital India” initiative (<http://digitalindia.gov.in/>). Likewise, in 2015 the government of Bangladesh emphasized the importance of an information technology infrastructure in its “Vision 2021” which was often referred to as “Digital Bangladesh” (<http://a2i.pmo.gov.bd/digital-bangladesh/>). In 2017 the Pakistani Ministry of Information Technology

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ABOUT THE

released its “Digital Pakistan” policy (<http://moit.gov.pk/policies/DPP-2017v5.pdf>). These are but some of the most recent steps in integrating technology worldwide.

As national and local governments seek to ensure adequate and equitable access to digital resources, digital literacy education and social inclusion to ensure that individuals in their own communities are able to take advantage of digital technologies in order to meet information and other needs, certain sectors of the population tend to be slower than others in engaging with technology in meaningful ways. This means ensuring that technology, training and socialization reach the edges of the population. Historically, in any range of countries and cultures, groups that tend to be underserved typically have included the elderly (Friemel, 2016; Wu, *et al.*, 2015), minority groups (Prieger, 2015), individuals with disabilities (Duplaga, 2017), the poor (Lee, *et al.*, 2016), children (Wong, *et al.*, 2015), rural individuals (Townsend, *et al.*, 2013), and women (Antonio and Tuffley, 2014). While age, minority status, disability, poverty and socioeconomic balances vary widely between countries, one constant, representing approximately 50 percent of any population, is women (World Bank, 2017).

Women once lagged quite far behind men in technology adoption and use, and still do in many countries (International Telecommunications Union [ITU], 2012), although usually by much smaller margins than decades ago. Still, the disparity encourages global organizations, such as UNESCO, to release reports such as its “Call to action to close digital gender gap”. UNESCO’s (2017) report notes that

“Despite worldwide efforts, the global Internet user gender gap grew from 11 percent in 2013 to 12 percent in 2016, with the estimated gap highest in Least Developed Countries (LDCs) (31 percent) and Africa (23 percent). Moreover, Internet penetration rates remain higher for men than women in all regions of the world.” [1]

These “calls to action” typically lead us to first question what factors might prevent women from adopting and using technology, and then, conversely to question what factors are encouraging women to adopt and use technology? There are many researchers studying the “what prevents” side of the equation, and so we rely on them to continue to explore and explain those elements. The purpose of our own research is to ask: What can we learn about social motivations and reasons for adoption and use of digital technology from women who *use* digital technology in their everyday lives? How might understanding these social factors be used to encourage digital inclusion in an emerging economy? Our research responds to a need reiterated by Nath and Barah (2017), who examined the Digital India initiative and called for measures to increase participation by women. How can we increase participation if we do not know of more than stereotypical aspects of adoption and use?



Literature review

Gender differences in technology adoption

Studies on ICT adoption by women are important in that they improve understanding of adoption behavior and identify factors that enhance and encourage adoption. There are ample differences between men and women’s technology adoption highlighted in the literature. That women report less confidence in their technical expertise and more negative attitudes about technology than men has been established (Broos, 2005; Cai, *et al.*, 2017; Gokhale and Machina, 2014; Howcroft and Trauth, 2008; Jain, 2006). Buche (2006) studied gender differences in defining information technology and identified variations in how even perceptions of technology differ by gender, with women defining technology “in terms of innovations that make life better or easier for the individual” or as something that might be used for “improved communication” whereas their male counterparts more often define technology in terms of computer equipment and “mechanical or electronic applications of science” [2].

In Venkatesh and Morris (2000), gender was included as a factor in the study of differences in technology use in the workplace; women were most likely to be motivated to use technology when they found it easy to use and

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when social influences encouraged technology friendly behaviors. An additional study by Venkatesh, *et al.* (2003) resulted in similar findings; recent studies of Web acceptance have found similar gender-based differences (Kim, 2010; Ong and Lai, 2006; Sánchez-Franco, 2006; Terzis and Economides, 2011). Interestingly, Venkatesh and Bala (2008) also found that perceived ease of use and perceived usefulness of ICT were not static personal attributes, but could be moderated with experience; that is, with increased experience a user will feel more capable and less anxious about technologies. Similar differences in gendered technology use were observed by Nysveen, *et al.* (2005) in their study of mobile chat use; usefulness drove intention for men compared to enjoyment and normative pressure for women. While both female and male participants “[assume] that technology leads to positive change” [3], there are differences in motivations for adoption. Men tend to use technology to complete a specific task, while women typically prefer to adopt technology to improve social connections and communication. These differences are socialized behaviors and can be modified with experience and training.

Gendered differences in technology use

Studies have also shown that women use ICT in their lives in various ways, and with different emphases than men in the same cultures and societies, for reasons related to their professional and workplace needs as well as home, family and personal care such as health and educational needs, banking, travel and hobbies (Ahrens, 2013; Hilbert, 2011; Thompson and Paul, 2016). Wong, *et al.* (2012) did not find any moderating effect of gender in their study of higher perceived usefulness, perceived ease of use and attitude towards computers; however, they were looking at computers in education which, over time, may have permeated the lives of either gender and reduced any gender gap. While there are calls for more research focused on gendered use of technology (*e.g.*, Nath and Barah, 2017), there is dearth of literature on factors that contribute to gendered ICT adoption and use in countries such as India. Findings from such studies can help digital campaigns incorporate measures to ensure an equitable and even distribution of ICT adoption, and may prove useful for furthering gendered digital inclusion in other countries as well.

Social factors influencing ICT adoption and use

The notion that gendered roles are socially constructed makes socio-cultural comparative analysis important in our discussion on ICT adoption and use. Socio-cultural expectations of women about ICT use are not always gender-based, but gender can play a significant role in determining interest in and adoption of new ICT (Li and Kirkup, 2007). Early ICT adoption research, such as Moore and Benbasat's (1991) study of adoption of information technology innovations, reflected that individuals seek social approval when adopting new technologies. Venkatesh, *et al.* (2003) added to this notion with their own findings that social influences are “more likely to be salient to older workers, particularly women ... during early stages of experience/adoption” of ICT [4]. This relates somewhat to Castaño and Webster's (2011) suggestion that the way that women use ICT needs to be considered based on contextual elements and life-course events. Domestic, workplace and other social contexts, such as gender regimes in the society, family structures and employment cultures, influence adoption and use of ICT in daily lives. In their comparative analysis of cultural influences on Internet adoption by women in the United States and Japan, Ono and Zavodny (2005) found that social roles influenced by national culture, such as gendered employment roles, have a significant effect on the adoption and use of technology by women. That social influences are particularly important for adoption of ICT underscores the importance of exploring these factors in varied contexts. Oreglia and Srinivasan's (2016) study of Indian and Chinese women as intermediaries in ICT use found that women have to constantly renegotiate their roles in family and community. This research underscores the need for a greater emphasis on understanding social context related to ICT acceptance and use.

Digital inclusion and healthy society

Some have argued that ICT empowers women, although the level of empowerment will depend on the level of access and actual usage of technologies. Hilbert (2011), for example, recognizes that women's use of ICT is significant for establishing egalitarian roles in labor and political markets as women have been unequally treated in the past and these inequalities have transferred to their uses of ICT. He calls for an examination of the positive attitudes and natural abilities that women have, such as good communication skills and media capacities, to overcome these

ICT use inequalities. Van Dijk and van Deursen (2014) also note that gendered differences in technology disappear as education and physical access to technology equalize. They reiterate our concern that socialization of the Internet is the issue at stake rather than fundamental gender differences in abilities or interests.

While Herbert (2017) and others have noted the increased opportunities for small business ventures and education that the Internet affords women in developing countries, when we look at the worldviews and pervading cultures of the Indian subcontinent, as in many parts of the world, we see that women often maintain traditional roles. In many cases women live in joint families, which consist of a married couple living with one or both sets of parents and sometimes an additional assortment of in-laws and relatives. According to Intel's (2013) "Women and the Web" report, women in India lack more in ICT awareness as compared to some other emerging economies with 31 percent disinterested and 40 percent unable to recognize its need in their lives. In addition, 48 percent of Indian women were reported to have expressed that they were not comfortable or familiar with technologies. The Intel report covers aspects of Indian women's ICT use that reflect the gravity of the gender divide in the Indian context with calls for timely measures to contain any far reaching consequences. Initiatives such as Digital India seek to ameliorate this divide, but the differences between offering technologies and training and actually experiencing digital inclusion are sometimes vast.

The use of ICT by women is worth exploring owing to factors that are social as well as behavioral. Gender balance in ICT adoption is not only a social equity issue. The underutilization of human capital will affect economic growth as women are excluded from contributing because of lower technology adoption (Warnecke, 2017). An understanding of women's use and non-use of ICT can help in achieving higher Internet penetration and digital inclusion. Improving gender equity can lead to important economic ramifications.



Method

This India case study follows an interpretive paradigm and is situated to explore an understanding of culture and gender applying case study methods. In qualitative research, the focus is set on uncovering patterns and meaning about a given issue. The goal is to "develop a complex picture of the problem or issue under study," by "eliciting and identifying the complex interactions of factors in any situation." [5] As in many cultures, stereotypes and gendered biases against women — both conscious and unconscious — affect ICT access, adoption and use (see, for example, Paul, 2015; Potnis, 2016; Prakash, 2012; Paul, *et al.*, 2015; Thompson and Paul, 2016). We chose qualitative case study methods as a means to analyze a broad aspect of Indian women's adoption of ICT, contextualized in order to understand how women might better be included in a digital society.

Information was collected through interviews that were semi-structured, partly conversational, and shaped by the interviewer so as to probe deeper into points of interest. A visual representation of the interview design is provided in [Figure 1](#). [Table 1](#) lists questions that guided interviews. The authors substantiate their interpretations of interviews by correlating evidence from literature, their own experiences and an understanding of social, cultural and environmental aspects under investigation.

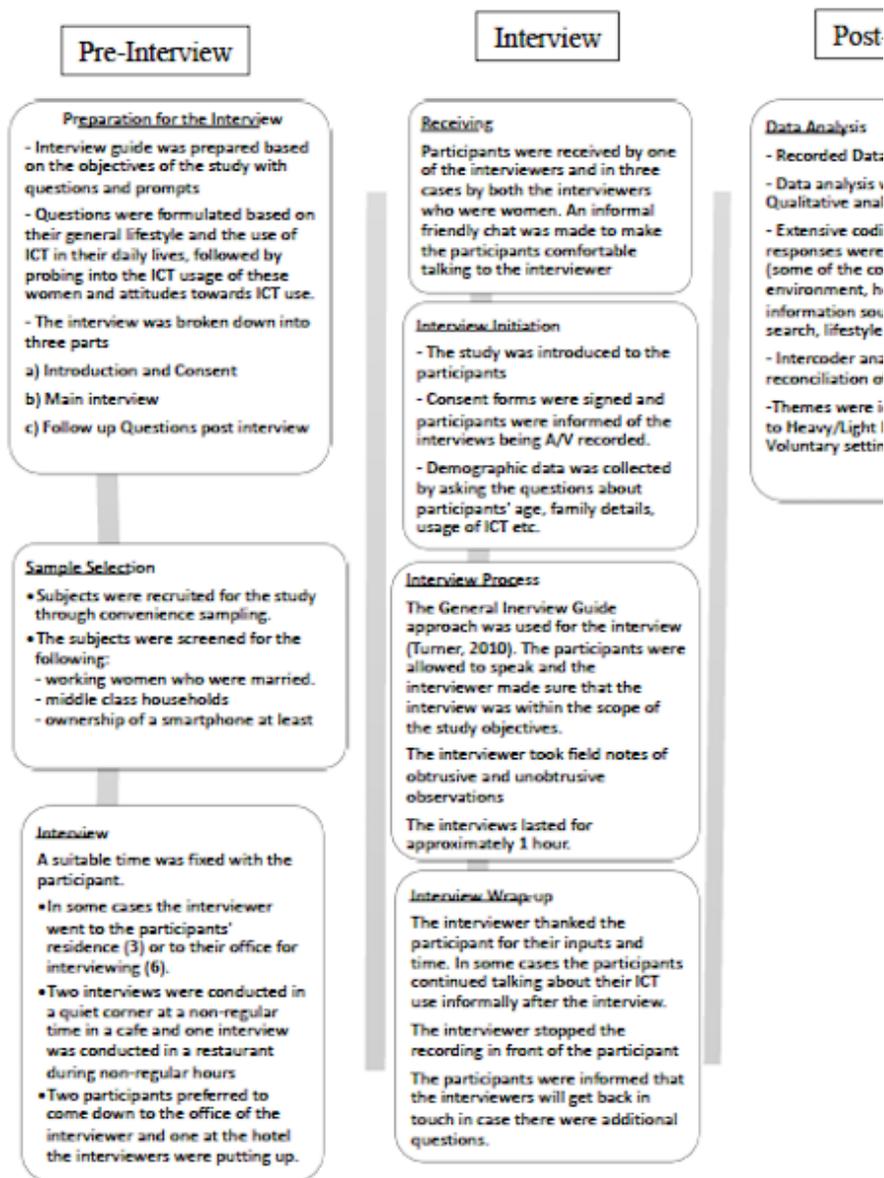


Figure 1: Interview design of the study.

Table 1: Interview guide.	
1.	Tell me something about your family background?
2.	What is your schedule on a typical day? How much time is dedicated to professional activities and how much time is personal (proportion)?
	Think about some time recently when you remember you needed some information — it could be for work or home or personal

3.	information. Could you please describe what information you needed and how you went about finding the information?
4a.	If ICT mentioned, Do you usually go about your search needs in the same order as like you did in this particular case? If yes, can you share another instance? If no, what other instances have you shared differently? Please share another instance.
4b.	If ICT not mentioned, Do you use IT to help you find information? If so, for what purpose? Which ones do you use?
5.	Which ICT device/s is/are frequently used? Why do you think one is preferable over the other?
6.	What is your impression of ICT? Do you think it has been useful for your purposes? Is it comfortable for you to use ICT? On a scale of 1 to 10 how would you rate your expertise of ICT?
7.	When did you first start using IT? (Year and reason)
8.	Can you imagine living your life without ICT devices? What significance does ICT hold in your lives?
9.	How would you have sought information you mentioned before if you had to without ICT?
10.	Have you noticed any change in your information seeking now than before when there were no such technologies around?
11.	How was your childhood use of technology? (Were you tech-savvy or not)?
12.	How is it now — are you tech-savvy compared to your environment? How would you compare yourself in your family/friends/colleagues?
13.	Do members of your family/relatives/friends come to you for any IT related help (not only tech but also information seeking)?

14.	How many times in a day do you use Internet technologies?
15.	What things do you look up on the Internet? Are you usually self-reliant or do you need help?
16.	What do you do when you need help regarding ICT? (e.g., another person from work? home? YouTube self-help vodcasts, blogs, etc?)
17.	What features of your ICT device do you find useful? (SMS, notifications-offers, sales, recharge offers, Flashlight, reminder/organizer, various apps — which ones)
18.	Would you rather find a non-ICT source or be self-reliant on the Internet for every day information?

Participants

This study focuses on middle class Indian women from a range of subcultures within the state of Kerala. Kerala is an Indian state with the highest level of gender equity and literacy rates (Government of India, 2015). All participants were working and reside in India but some were reared in different towns across India and one completed her schooling abroad before returning to Kerala. We wanted to ensure that participants in this study had adequate physical access to digital resources and adequate literacy and language skills to minimize physical and intellectual access barriers (see Thompson, *et al.*, 2014). We selected a target population of middle-class women who were gainfully employed and used ICT in the workplace. We selected 15 participants with tertiary degrees (most likely to have functional literacy skills) and who had used ICT for at least five years. We wanted to capture the narratives of women who felt some level of confidence with technologies to allow them to tell their personal stories of that engagement. In order to ensure all participants had access to and experiences with ICT, the participants of the study were identified through convenience sampling. Upon completion of an initial interview, each participant was asked if she could recommend someone else from her social network that uses ICT and might be willing to be interviewed.

With grounded theory, the interview relies on the interviewer’s expertise to understand when to stop collecting data. Morse (2007) noted that with better data quality, fewer interviews and participants are required. With grounded theory methods, data collection and analysis operates hand in hand and each informs and streamlines the other (Bryant and Charmaz, 2007); the researchers, with considerable experience in qualitative inquiry, began hearing similar themes after 10 interviews and concluded data collection after 15 interviews. The 15 participants ranged in age, employment and years of experience with ICT and the Internet; [Table 2](#) provides participant details. Information was collected between October 2014 and May 2015. Pseudonyms for participants are used throughout this paper.

Table 2: Participant profiles.			
Participants/Attributes	Age	Profession/Industry	Year exper with

Anu	32	Entrepreneur /hotel	1
Beena	35	Anesthetist and faculty/medicine	1
Charu	34	Dentist and entrepreneur/medicine	1
Diya	35	Bookseller and radio-announcer/Media and publishing	1
Ela	33	IT professional/Education	1
Farha	43	IT professional/Telecommunications	20
Gayatri	45	Pediatrician/Medicine	1
Hiya	47	Ophthalmologist/Medicine	1
Indira	26	Dentist	1

Jagruti	34	Service Operations Assistant Manager	1
Kajal	31	Assistant Manager in Customer Service	1
Laila	34	Clinical Safety Manager	15
Meera	27	Creative Designer	1
Nisha	33	Journalist	1
Oorja	29	Journalist	1

Data analysis

Field notes during the interviews and transcriptions of the recorded narratives were coded for inductive analysis (see [Figure 1](#)). During data analysis the researchers intermittently stepped back and went over the coded matter together. This allowed for an interactive and comparative approach accorded in grounded theory (Charmaz, 2008). The inter-coder discussions led to identification of four "strands" of ICT users, as illustrated in [Figure 2](#). A heavy and light category for ICT use is not meant to quantify degree of use but to assess ICT use in everyday lives that involved settings of work (mandatory) and leisure (voluntary) which in turn varied across participants. We will highlight similarities and differences between the women in each strand to provide insights into factors that may have influenced their adoption and use of technologies.

Figure 2: Characteristics of participants based on type and frequency of ICT use.			
		Mandatory setting	
		Heavy use	Light use
		H-H Group	L-H Group Beena, Indira — Heavy ICT use in voluntary settings but

Voluntary setting	Heavy use	<p>Anu, Ela, Jagruti, Kajal, Meera</p> <ul style="list-style-type: none"> — Heavy ICT users for mandatory and voluntary settings — High levels of confidence — ICT integration across all spheres of life (professional, personal, entertainment, etc.) — Ranging between 10 years to 17 years experience with ICT 	<p>ICT not needed or needed minimally for work</p> <ul style="list-style-type: none"> — Performance expectancy and effort expectancy played a role in intention to use ICT. — Facilitating conditions enabled use of ICT such as strong technology infrastructure, availability of useful mobile apps — Years of ICT experience ranging between 10 and 13 years
	Light use	<p>H-L Group Farha, Laila, Nisha, Oorja</p> <ul style="list-style-type: none"> — Heavy ICT users in mandatory setting and light users for voluntary setting — ICT use driven by performance expectancy — Inclination to incorporate ICT in their personal lives was low. — Between 15–20 years experience with ICT 	<p>L-L Group Charu, Diya, Gayatri, Hiya</p> <ul style="list-style-type: none"> — Minimal use of ICT in both mandatory and voluntary settings as there was less performance expectancy through ICT use in their professions — High effort expectancy leads to low intention to use ICT — In some cases low facilitating conditions also contributed to non-use — Between 8–13 years experience with ICT



Findings and discussion

There is a range of theoretical work related to technology adoption and use, including Rogers' (1962) diffusion of Innovations theory, Davis' (1986) classic technology acceptance model and Venkatesh, *et al.*'s (2003) unified theory of technology acceptance and use of technology (UTAUT). UTAUT (Venkatesh, *et al.*, 2003), the latest derivative of these frameworks,

focuses on themes such as the degree of belief that the system or technology use will lead to better performance (performance expectancy), how easy it is to use the technology (effort expectancy), social norms encouraging technology use (social influence) and degree to which an individual feels supported in her use of technology by the system in which she resides (facilitating conditions). We found that these themes were indeed apparent in our participant narratives.

Though saturation was reached when hearing the same themes appear repeatedly in interviews, the in-depth analysis of transcripts revealed that participants reflected different levels of ICT adoption across mandatory (work related use) and voluntary (personal, non-work use) settings that cover their everyday lives. However, there were mandatory technology use situations in non-work settings, such as using ICT for banking or bill paying, which were coded as “voluntary,” as they did not make any significant difference in the findings of this study. We follow with a discussion of factors of ICT acceptance in the lives of participants.

Findings

Each of our participants use ICT in their professional lives to some degree. Based on their information about how they use technology in a typical day, we categorized participants into four strands, according to use — mandatory and voluntary — and within each type, frequency of ICT use — heavy and light — as presented in [Figure 2](#). We discuss each of these categories in the following subsections.

Heavy Mandatory Use — Heavy Voluntary Use (H–H). The H–H strand — Anu, Ela, Jagruti, Kajal and Meera — consists of the most prominent ICT users. Each of these participants works in different industries, and both their professional and personal use of ICT are motivated by their affinities towards ICT as reflected their enthusiasm for technologies. For example, Anu works in the hospitality industry, managing her family’s hotel business. Using ICT, she has been able to manage her business from a distance while she travels. Her work-related ICT use is mostly for keeping herself updated with office e-mail messages. She checks her e-mail for business reports throughout the day, and she regularly checks Facebook for reviews of the hotel, using other apps and technologies for projects related to her business operations. For Anu, low effort expectancy was a determinant in her intentions to use ICT: that is, she expected technology to reduce the amount of effort needed to complete a specific task. She was constantly updating and upgrading her devices.

Ela, a manager in the education sector who is a heavy voluntary and mandatory user of technology, also reflected an appreciation of the low effort expectancy that technologies provide for her work life. She found her mobile to be particularly useful when she travels, “because my job also requires constantly checking [e-]mails and replying.”

For the participants in the H–H group the inclination towards ICT use along with performance expectancy — or belief that the system use will lead to gains in job performance — seemed to drive their inclination to use ICT. For example, in Jagruti’s narrative, as she described facilitating conditions provided by a sound ICT infrastructure and availability of online services, she said: “You can see my technology proneness in my everyday activities which I do based on technology, see I’m addicted to that My phone, it’s with me all the time so I’m addicted to my phone and I use almost everything that my phone has to offer and yeah you can say that about my laptop, and, you know, [other technology] at home” [Jagruti]. She added that she felt that if there were even more technology available, she would be interested.

Meera, a creative designer who works regularly designing software, said she searches the Internet constantly. She works from home, and, similar to Anu and Ela, an ability to work from home was a facilitating condition for ICT use for voluntary purposes. Her family has supported her interest in technology since her childhood. This social support for technology use was a theme that was common with the H–H group. Kajal, a customer service assistant manager who also uses ICT for work extensively, noted that it was her colleagues that provided social support. She stated, “A lot of them [meaning colleagues], I think almost everybody in office, [would give me ICT responsibilities]. If there’s a function ... they would [ask me]”

Venkatesh, *et al.* (2003), in their UTAUT model of technology adoption, stress social influence as having a direct relationship with intention, moderated by experience. We too found that social influence for voluntary use of ICT can be an important factor of ICT use in communities. For

example, Kōu, *et al.* (2017) reported on the support of family members as well as the environment that they grew up in. These factors may reduce technophobia for some women in India. Considering the traditional roles of women, normative pressure by family and work colleagues to perform a non-traditional behavior of using ICT is an aspect not often explained in the literature, although theories such as Chatman's (2000) theory of normative behavior provide some structure for understanding this. Chatman postulates that socialized "small world" attitudes affect everyday information seeking behavior and help establish "rightness" and 'wrongness' in social appearances" [6], help determine what channels one pursues in order to obtain information as well as determining what information is accepted into the small world. She notes that "worldview," or "the [sociocultural] collective view that leads to understand the workings" [7] of everyday life strongly influences what is relevant and useful to one's everyday world and what is not. In other words, when introduced to new ICT and information, we act in accordance with norms set within the social world that we have built around ourselves. However, we note that normative pressures can also work adversely, as detected in ICT use by light use groups.

Heavy Mandatory Use — Low Voluntary Use (H–L). Participants in the heavy mandatory use and low voluntary use (H–L) group — Farha, Laila, Nisha, and Oorja — were mostly unwilling ICT users who said they used ICT heavily mainly because it was required for work. Farha is an information technology professional in government performing computer programming and conducting online searches for government policies. Laila is also a regular ICT user for professional needs but not much for her personal needs. In terms of ICT use for work, "because we [are] involved in a lot of training [in the medical field] ... we need to keep [ourselves] updated on many things" [Laila]. Her work, or her performance expectancy, directly affects ICT use intention. However, given a choice she would rather have minimal digital access; she chooses to use little technology in personal, voluntary situations.

Nisha, a journalist, is also a reluctant ICT user but uses it extensively at work. According to her, "I am not a very prolific user ... I mostly use it for my work and having access to Internet makes a lot of things easier for which I would otherwise have to spend a lot of time finding the facts and checking the facts." Apart from searching the Internet for facts and figures ICT helps in her role as a journalist. She states:

because I have WhatsApp it makes it a whole lot easier to send and receive photos, photographs because whatever story you do, you need a photograph to go with it and this was very difficult otherwise because if you cannot get a photographer to go with you it becomes a problem. So because I have a smartphone I can take pictures, I can double up as a photographer and reporter and it is easier to bring it back and transfer it into the system. [Nisha]

Oorja, also a journalist, recognizes the usefulness of ICT in being proactive about different work affairs that could help her professionally. She notes regarding her ICT use:

If I find any doubts which I am having I just check it on the [Internet]. I mean like that, I do kind of everything ... for my work and not just for my work, but mostly for my work ... like you get some flash news on television, something happened, and I'll just think okay, let me check on [the Internet]. I'll check on it, like that. I mean I seek information to see if there is something, something which I can use maybe for possible stories, or just to find out. [Oorja]

Nisha also commented that there are lot of things that she could use the Internet for but she does not, by her own choice. There was a clear denial of incorporating ICT in their lives as a conscious decision or attitude, attributed by UTAUT to effort expectancy. This also indicates how effort expectancy can lead them to use ICT for mandatory purposes, however they exercise restraint when it comes to voluntarily using ICT. Hence, effort expectancy played a neutral factor in ICT use for these women. An explanation for this can also be drawn from "small worlds" these women are comfortable in even though they may be confident ICT users. The tech-averse image of women may have led to reduced ICT use for voluntary

purposes. Experience in ICT use did not seem to change this though it was unclear if there was any improvement in voluntary ICT use over time.

Low Mandatory Use — Heavy Voluntary Use (L–H). The third group of users, low mandatory use–heavy voluntary use (L–H), reflects ICT use of two participants: Beena and Indira. Beena and Indira were motivated to use ICT for personal voluntary purposes in spite of not much mandatory use at work. The low effort expectancy for these participants was a cause for technology use intention. These women found ICT use to be comfortable, helping them maintain private lives as a metaphorical window to the outside world. Beena, a medical professional, notes that there was not much need for Internet use for her as a doctor except for work where she may look for information related to vital statistics. One factor discouraging her use of ICT is poor facilitating conditions due to a weak wireless connection at work. She states that because of the work connection, sometimes she has to save work related things on her phone and that for some repeated cases she has saved information (dosage related) on her phone so she can refer to it quickly.

Indira is a young dentist who noted that she was not required to use ICT for work at all, but that she uses her mobile apps extensively and voluntarily. As with the H–H group, family influence and encouragement helped them in adopting ICT in their lives and due to a lack of performance expectancy they did not really adopt ICT for mandatory purposes. Since there were just two participants that fell into this group, we refrain from examining in-depth their ICT use behavior. Future studies could explore if the low effort expectancy and high facilitating conditions owing to family support and easy technology could lead these users to incorporate ICT even more actively in their work lives for voluntary purposes.

Low Mandatory Use — Low Voluntary Use (L–L). Finally, participants Charu, Diya, Gayatri and Hiya demonstrated low mandatory and voluntary use of ICT (L–L). These women have ICT access, but use it minimally for both mandatory and voluntary purposes. Three of the four participants in this group (Charu, Gayatri and Hiya) are in the medical profession. Charu has used ICT for work mainly for her family-owned dental clinic. Her use of ICT is primarily for finding contact information of dealers of dental instruments and “material things” they use in the clinic. She states, “so many dealers [are] there, I would search for their contact number and know what all products they provide. So, I just take their contact number and call them directly” [Charu]. She also uses ICT for designing and approving brochures for their clinic. ICT use in this case for a mandatory setting is meagre but is supported by enhanced performance expectancy leading to enhanced intention to use ICT. There were indications how she was comfortable with her “small world” normative life owing to hindrances that came from trying to remember a password or use a credit card. She felt online financial transactions were risky and she said she would rather have her husband deal with such things.

Gayatri and Hiya, both active medical practitioners, also do not need to use ICT much in their professional lives. Gayatri mentioned that the only time she gets close to using ICT for work is when “there is a diagnostic dilemma.” She adds that “[sometimes] we’re not able to come at a diagnosis. Then sometimes we just Google and see what it can be like or maybe suppose sometimes we get a syndrome like a complicated case where we’re not sure what it is. Then we Google to read more about it. So that way I use it.” Gayatri also had some support from her medical colleagues that allows her to distance herself from ICT. She says she does not need to use the Internet much because her colleagues will access the Internet for her and help her with information related to dosages. She remarked, “There are certain medicine [apps] that can be downloaded where you’ll get quickly the dosage formula. So they [her colleagues] are using it because, as I said, I don’t have [an Internet] connection; I’m not using it but they do use it.” The effort expectancy in ICT use — based on not having ready Internet access — also further hinders her use since she would rather ask her colleagues for information using ICT rather than find it herself.

Likewise, Hiya, also a medical practitioner, relies on her assistants for any kind of ICT related needs. The performance expectancy for medical professionals in this case is low and hence does not require them to use ICT. Adding to it is the effort expectancy that is high owing to efforts associated with connecting with the Internet and the non-inclination or the negative attitude towards ICT use which directly affects the intention to use ICT. In addition, none of the three participants — Charu, Gayatri or Hiya — had positive experiences from childhood or young adulthood to encourage

them to use ICT. The literature does not clearly indicate the role of support in terms of formal training given through educational institutions or informal training given by family and friends which enhances ICT use confidence and hence influence an intention to ICT use. In our findings we noted that women who had more support or examples of technology use in their youth tended to be more inclined to engage with technology as adults.

The only non-medical professional in the L–L group, Diya, works at a small press and works also as a bookseller and part-time radio announcer. Although middle-class, Diya did not feel she could afford her own personal ICT device which hence hampered her adoption of ICT for voluntary purposes. She uses her office computer for mandatory use at work and sometimes uses the office computer for personal purposes, while other times she takes advantage of cybercafés. Her friends also support her ICT related needs. Her meagre use of ICT for work can be attributed to performance expectancy that is a direct determinant of ICT use intention. The lack of facilitating conditions also led to the non-use of ICT whereas effort expectancy was not found to play a role in her ICT use intention though she was aware of the benefits of ICT and had a positive inclination towards it.

Each of the L–L women noted that family members or colleagues helped them find information, check e-mail or engage in e-commerce activities that they otherwise might have had to do themselves online. A second reason for non-use of ICT was built in the notion of adverse lifestyle and health impacts of ICT. Charu, Gayatri and Hiya each cited this as a factor that prevented their pursuing ICT more actively. Such health related factors determining ICT use are facilitating conditions directly related to it. It is possible that such factors could also be directly related to intention to ICT use as was evident for the participants in this group.

Discussion

Our findings indicate that social influence in ICT use by women has been primarily through internalization and identification. Though Venkatesh, *et al.*'s (2003) UTAUT framework has enabled us to understand some factors responsible for our participants' behavior in ICT use, Chatman's normative behavior theory also provided some insights into social influences on ICT adoption and use of our participants.

One social influence that was obvious in the participants' ICT use was their reflection on how their families supported them in their childhood when they had opportunities to interact with ICT. Those women who indicated the most interest in voluntary ICT use — those in the H–H and L–H groups — told stories of how their family members encouraged them to use and play with ICT when they were young. We found childhood support and encouragement as an enhancer to ICT use that was also a reason for these women to break through traditional normative roles, as noted in the literature. Another factor was their own attitudes and positive inclinations towards ICT. Compared to other groups these women were open to experimenting and using ICT. Further, availability of advanced technologies in the form of smart mobile devices provided the right conditions to enhance ICT use.

Social influence was also present in the H–L group, those who were prompted by the demands of the work to use ICT and had primarily limited it for those purposes only. Even the participants who belong to the L–L group, social influence was what encouraged them to use technology outside of work. The L–L group rarely used ICT for work or at home, based most of their technology use on communication with friends and family, and some used it to help their daughters with school projects. In one case, a daughter played a role in getting her mother to more fully adopt ICT in daily life because “everybody” was using smartphones, but her mother. This could be examined more carefully using another of Chatman's (1999) ideas, theory of life in the round. With this notion, Chatman introduces how the appropriateness of behavior is judged by “life in the round” that works on predictability. It is only during certain times that there is a need to cross these information boundaries which she identified as critical information needs, a collective expectation that information is relevant or a collective perception arises that the “life in the round” is no longer functioning. Likewise, Savolainen (2016) identified the features of the small world barriers as distrust of outsiders as information source and avoidance of risk-taking. In other words, when introduced to a new ICT, until unless there is a dire need, we act in accordance with the norms set within the social world we have built around ourselves.

The H–L and L–L groups indicated they were comfortable in their “round lives” determined by their small worlds. Though they had broken traditional gender social norms by taking up professional roles, still they were inhibited to learn to use new technologies because of gender social norms and often saw their male counterparts to be better technology users. They used their social system of family, friends and workplace colleagues and subordinates to enable them to keep from adopting ICT more fully in their lives.

Conversely, participants in the H–H and H–L groups were driven by performance expectancy for ICT use at work. The H–L group were heavy users of ICT at work but were reluctant to use it for personal purposes indicating a stronger influence of performance expectancy that drove mandatory use. Nevertheless, ICT use at work did not help in forming positive perceptions of ease of use or usefulness of ICT for H–L participants.

Taking a look at factors that might cause non-use of ICT for personal purposes for the H–L group, a different set of causes emerged. Some voluntary use of ICT was motivated by duty boundedness towards children and their academic needs. The light or no use of ICT emerged from the lack of connection to ICT use for their familial roles. In this case, experience and work related ICT use did not affect intention for personal or voluntary ICT use.

Non-use of ICT for personal purpose in spite of heavy ICT use in work settings further stresses the disconnect between perception of ease of use or usefulness on attitude towards technology use. It is possible that there is an adverse relation between their perception of ease of use and usefulness with attitude but these women seemed to have a positive attitude towards ICT, but that did not affect intention to use technology personally. Within the parameters of our study, light use of ICT for personal purposes was by choice and not due to a technology phobia. Participants from the H–L group seemed likely to be avoiding ICT for personal use even though they used it more than characteristic novice users in the L–L group.

Factors responsible could be a social perception of women and their tech-averse image or their own disinterest or negative attitudes, both of which had been seen as contributing to less ICT use. Our findings suggest that proper grooming and encouragement can provide better support to tech-averse women for improved voluntarily adoption of digital technologies which may not have been made available to them. It has also been established in the literature, and our study indicates, that user-friendly digital technologies that are built keeping in mind the needs of women and their behaviors will lead to faster adoption.

ICT has proven to be of immense help as devices to complete work conveniently and at faster speeds, and using ICT for work purposes may have enabled some participants to form positive perceptions about the usefulness and ease of use of ICT. Nevertheless, ICT use at work does not appear to be the sole factor for forming positive perceptions of ease of use or usefulness of ICT. Explaining ICT adoption in the personal lives of working women may imply a different story altogether as compared to what happens at work. The personal lives of these women are guided by factors that are different than workplace constraints.



Conclusion

As Digital India and other national and international policies and movements seek to ensure equitable access to digital technologies throughout the Indian subcontinent and the world, we must consider factors beyond simple physical access to technology and basic computer literacy skills that affect ICT adoption, use and enjoyment. Simply providing access to households or to workplaces or public places will certainly contribute to digital inclusion, but social factors also need to be carefully considered. Women often lag behind in ICT adoption and use worldwide. As noted earlier, some have suggested that this is simply the way it is, and that women will eventually catch up and perhaps even surpass men in using the Internet and associate technologies. However, it is not enough for women to simply “catch up” to men in ICT use. For social inclusion as well as reasons of interest and personal fulfillment, factors that affect adoption, use and enjoyment of ICT require careful study and analysis.

This study might be used to expand understanding of how organizations from schools to whole communities best influence girls and women to

adopt, use and enjoy ICT. High performance expectancy is not necessarily the best or only path to lead women to become involved in ICT related work or personal activities. The women that participated in this study indicated a more positive response to social influences and facilitating conditions than to performance expectancy and effort expectancy. There are women who are slow to adapt to ICT use as they tend to adhere to normative expectations which may hinder ICT use. Women tend to have greater intention to ICT use if it is for fulfilling familial roles as well as for communication. This research also has the potential to inform how governments and institutions need to conduct programs on a regular basis that help these women to push their comfort levels and hence lead to a change of attitude to incorporate new roles as comfortable ICT users. Our study also assists future research related to the effect of parents and social communities in the encouragement of girls and women to develop and maintain interest in ICT in their professional and personal lives. 

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