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Beyond Access to Information: Understanding the Use of Information by Poor Female Mobile Users in Rural India

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RUNNING HEAD: Information Use and Digital Inclusion

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ABSTRACT

Digital inclusion research has focused overwhelmingly on access to information. But access to information by itself is of limited value unless the intended beneficiary has the capacity to use it. It is the use of information that delivers the benefits. However, in ICT for development literature, there is little empirical work on the process by which use of information delivers benefits. This study fills the gap by studying information use by poor female mobile phone users in rural India. It identifies six stages in the information use process and models them.

Keywords: digital divide, digital inclusion, use of information, information behavior, information needs, access to information, information seeking, grounded theory

INTRODUCTION

A study commissioned by the United Nation's International Research and Training Institute for the Advancement of Women found that "access to information" is a key ingredient for women's empowerment. It states that information and communication technologies (ICT) can benefit women if they are capable of determining: "(a) the type of information they need, (b) the way that information is presented, and (c) the concrete means required for that information to be accessed and used" (Huyer and Sikoska 2003, 9). In the same vein, World Bank's sourcebook on Empowerment and Poverty Reduction states that access to information is one of the key elements for empowerment of disadvantaged populations, since information enables people to take advantage of opportunity, access services, exercise their rights, and hold state and non-state actors accountable (Narayan 2002).

However, the existing studies have tended to focus overwhelmingly on access to information. They have identified various barriers that prevent access to information including: high-cost access to information infrastructures (Cecchini and Scott 2003), lack of access to relevant information (Arunachalam 2002), lack of content that speaks to women's concerns, language and cultural contexts (Huyer 2005), insufficient metadata (Martinez and Reilly 2002), and lack of appropriate skills for processing available information (Mijumbi 2002). This preoccupation with access to information results in the view that the main challenge is to identify women's information needs (e.g., education, family planning, legal matters), to focus on pre-existing information infrastructures in the community, and to prioritize actions needed to help women access information (Solange and Momo 2000).

But access to information by itself is of limited value unless the intended beneficiary has the capacity to use it. In a nutshell, access to information is a necessary but not sufficient condition. It is the *use of information* that delivers the benefits. However, in ICT for development (ICT4D) literature, there is little empirical work on the process by which use of information delivers benefits. Moreover, the research that does exist (Meyer 2005) does not look at the interplay between antecedents for the use of information and the process by which benefits are derived. On the theoretical plane, Heeks and Duncombe (2001) theorize *access, assess, apply,* and *act* to be the four key steps in efforts that use ICT to the benefit of disadvantaged communities. However, this theorization remains untested in the field.

The current study fills the gap by studying information use by poor female mobile phone users in rural India. It focuses only on the efforts of information use that lead to benefits for the user. It is possible that the user might fail to derive benefits from information use; however, that possibility is not within the scope of the current study.

The mobile use is a particularly good case for the present analysis. Mobile has extended the right to communication in the democratic sense, as unlike other ICT it extends access to communication with a low number of socioeconomic pre-requisites (Fortunati 2002). On the one hand, the mobile places women in a broader flow of events and gives them the ability to enlarge their sphere of interaction (Jagun et al. 2008). On the other hand, it enhances their capacity to maintain and strengthen relationships (Fortunati 2000; Licoppe 2004; Ling 2008).

India is a good context to study mobile use by poor women for a number of reasons. Despite conservative cultural norms and various restrictions imposed by

family members in a male-dominated society, as of 2011, approximately 225 million women owned and used mobile phones in India (Vodafone India Group 2011).[1] A 2012-study conducted by the GSMA Development Fund and the Cherie Blair Foundation found that 28 percent of Indian women own a mobile phone compared with 40 percent of men. An additional 20 percent of women have access to mobile phones through family members or friends (Roy 2012). Moreover, mobile prices are low by world standards – low-end mobile phone costs around $15-20 and call tariffs stand at 1 cent per minute, cheapest in the world.

We start our discussion with a brief overview of the research in information use. We then discuss the conceptual model that guides our current analysis – Wilson's (1997) Global Model of Human Information Behavior. Thereafter we discuss the research design, data collection, and data analysis. Lastly, we discuss the findings and their implications for future research.

INFORMATION USE

Information science defines *use* as: (a) an abstraction – use of information as a generality with no operational definition (Myers 2007), (b) a facilitator – use of information to satisfy needs (Merry 2006), (c) an implement – use of information resources as a tool (Josey 1962), (d) a process – the ways in which users use information to achieve an end (Maybee 2006), (e) an instance – use of information measured quantitatively (Rice 1979), and (f) a connector – transactions that lead to other uses of information (Borgman 1996).

As a process, information use can be characterized as dynamic, iterative, interactive, user-centered, and contextual in nature (Fleming-May 2008). Typically

information needs arise from gaps in the user's reality. While information need initiates the process, the information use process itself is a complex one, where there are a number of antecedents to information use including level of motivation, understanding of the problem that is being addressed, and information ambiguity. It is this use of information that facilitates sense making (Dervin 1999).[2]

The process dimension of use focuses more on the user rather than the usage of information resources. In other words, discussion and evaluation of *use as a process* is centered on the user.

CONCEPTUAL MODEL

To examine the information behavior of mobile phone users, the present study employed Wilson's (1997) Global Model of Human Information Behavior[3], which is widely used by researchers and practitioners. This model is based on theories from decision sciences, consumer behavior research, marketing and innovation research, psychology and cognition, health-communication research, and information systems design – all of which take into account "use of information."

The model has three constituent constructs: (1) context of information needs, (2) information-seeking behavior, and (3) information processing and use (see Figure 1). It has two moderating variables: (a) activating mechanisms (informed by stress/ coping theory, risk/reward theory, social learning theory, and other theories), which explain the amount of effort expended by users during information interaction, and (b) intervening variables (e.g., psychological, demographic, interpersonal, source characteristics, and environmental variables), which could be facilitating or hindering factors in information

seeking activities. Each cycle feeds back into the user's information context and thereby influences subsequent ones.

[Insert Figure 1 here]
Figure 1. Simplified Version of Global Model of Human Information Behavior
(See Wilson (1997) for Original Model)

RESEARCH DESIGN

Female participants of the study worked part-time for a small-scale women run cooperative Mahila Gruha Udyog (MGU) in Bhor, a community of little more than 20,000 people in the state of Maharashtra in western India (PMC 2011), where they were involved in the seasonal activity of preparing traditional snacks. Despite earning less than a dollar a day, they were able to own and use Reliance (basic models) and Nokia (1100 series) mobile phones for more than a year at the time of the study. The author had ties with MGU due to prior social work he had carried out in conjunction with small businesses and non-profit organizations in India.

Data Collection

A female manager of MGU acted as a local facilitator of research activities, including the engagement of 43 MGU employees for an open-ended face-to-face group-administered survey. It took around 15 minutes for participants to complete the paper-based survey. In the case of illiterate participants, the female manager helped them fill in their survey responses. Since these respondents were selected based on their availability, the sample was not a random one. Each survey participant was compensated with 25 US cents (15 Indian rupees) for this short survey.

The respondents were asked questions such as the following: (i) How did you realize the need to own your own mobile phone? (ii) Did advertisements and promotions

influence your decision to buy a mobile phone? (iii) What was your confidence level when you used a mobile phone for the first time? (iv) With whom did you communicate with your mobile phone? (v) Did anybody encourage or discourage you from using a mobile phone? (vi) Do you use text messaging? (vii) Which languages do you prefer on mobile phones? (viii) What was the main reason for using mobile phones? (ix) Who paid your mobile phone bills? and (x) Would you be interested in sharing your experience of using mobile phones in-depth over phone?

If the survey respondents were willing to further share their experience of mobile phone use, they were contacted later for an in-depth phone interview. The author conducted semi-structured open-ended interviews with 22 out of 43 survey participants.

The author and interviewees communicated in Marathi, their common native language. The author did not employ a female interviewer because he wanted to understand the use of information by female mobile phone users on a first-hand basis. Since a face-to-face interview with a male interviewer could have caused many respondents to shy away from sharing details of owning and using mobile phones, the author decided to converse with the respondents over their mobile phones. Each interviewee was compensated with 50 cents (30 Indian rupees) at the end of each interview. Incoming calls are not billed in India, thus interviewees did not spend any money on their phone conversations with the author. The average duration of phone interviews was 15 minutes.

Data Analysis

Data were coded according to salient categories that emerged from the interviews and open-ended survey responses (Corbin and Strauss, 2008; Glaser and Strauss, 1967). For instance, a number of open codes led to four axial codes representing human barriers and technical barriers for processing and using information (see Table 1). Despite different barriers, respondents were able to continue using mobile phones, which suggested that they overcame barriers to processing and using information. Hence, “Overcoming Barriers to Receiving, Processing, and Applying Information” emerged as one of the steps towards digital inclusion.

[Insert Table 1 Here]

Table 1. Analytical Process used to Derive “Overcoming Barriers” Step

FINDINGS & DISCUSSION

Mobile phones expose women to different resources and thereby offer opportunities to enhance their capacity to benefit themselves. Whether or not that potential is realized depends on several contextual and personal factors. Furthermore, as Sey (2011, 387) puts it, high levels of mobile phone usage do not mean development of mobile phone users, especially “if other elements in the livelihoods environment (e.g., vulnerability context, livelihood assets, transforming institutions and structures, livelihood strategies) are not appropriately aligned.” Hence we need to treat the process outlined below with a degree of tentativeness.

Step 1. Accessing Mobile Phones

Respondents accessed mobile phones only after realizing their utility, but these realizations manifested in different ways. For instance, a group of 13 women, labelled

as Group 1 (G1), recognized the utilitarian value of mobile phones on their own. In contrast, husbands played a key role in helping a group of 30 respondents, referred to as Group 2 (G2), realize the need of owning and using mobile phones. Children and female friends at work were secondary actors in helping G2 grasp the significance and necessity of mobile phones in their lives. When it came to continued use of mobile phones, husbands, children, female friends at work, and relatives were the key supporters for G2, whereas female friends at work were the strongest supporters for G1.

All members of G1 were unmarried women with an average age and education level of 26 years and 16 years, respectively. G2 had women married for more than 20 years with an average age and education level of 45 years and 11 years, respectively. In rural India the life of a married woman revolves around her husband, children (if any), and in-laws. Since male children are expected to take care of their parents, married women often end up living with their in-laws. As a result, most of the women's decisions are also controlled by their husbands and in-laws. In the case of Archana, who was married for 27 years, her husband made her realized the utility of using a mobile phone. But she faced strong opposition from her mother-in-law for owning and using a mobile phone. She stated:

> I have a mother-in-law living with me. For a variety of reasons, she always prevented me from buying a mobile. She opposed me a lot. She used to ask me: What is the need? It would be a great trouble. People would keep coming to you for using your mobile for free. My husband and I thought a lot about it. But we did not rush at all ... Almost a year or year and a half passed away … Afterwards, my mother-in-law was convinced that I could make a good use of mobile.

Archana's mother-in-law had a fear of neighbors and other relatives using her mobile phone for free. For Archana's mother-in-law, the potential benefits of a mobile phone paled in comparison to the fear that loomed larger in her eyes. It was not easy for Archana and her husband to convince her of the benefits of using a mobile phone.

Although G2 had not realized the need of using mobile phones on their own, they bought the mobile phones with their own savings. Their decision to buy a mobile phone was influenced by advertisements and promotions offered by mobile phone manufacturers and service providers. Model and brand name, and company reputation were the key criteria considered by G2 for purchasing mobile phones. In contrast, features and functionalities of mobile phones drove the selection of mobile phones by members of G1. They were not influenced by any commercial advertisements since their expectations from a new mobile phone were clear. All of them knew which features and functionalities they were interested in. Irrespective of criteria for selecting mobile phones, there was a strong sense of intimacy and comfort in respondents' talk about their devices.

Free incoming calls, free incoming text messages, and one of the lowest talk-time rates in the world made mobile phones an affordable ICT solution for the respondents. In addition, a few respondents (n = 5) reported using "missed calls" for conveying messages. Pre-agreed meanings associated with a number of times a mobile phone rang helped to communicate messages. For instance, a daughter would call her mother and disconnect the call after the mother's mobile phone rang twice, which would mean that the daughter reached her work safely. This finding is similar to Donner's (2007) report of the widespread practice of "beeping" or "missed calling" between

mobile phone users who own small and informal businesses in Kigali, Rwanda. Most participants in Donner's study used beeps for requesting others to call back immediately, whereas the respondents in the present study use beeps and missed calls to keep monthly bills as low as possible. Members of G1 and G2 paid the monthly charges of their mobile phone usage without depending on anyone.

Step 2. Identifying Context-Specific Information Needs

For disadvantaged communities, the process of understanding information needs is grounded in the social environments in which they live their lives (Chatman 1996). In case of the present study, due to family-related responsibilities and expectations from husbands, in-laws, and children, G2 had a higher number of social needs when compared to G1. After marriage, generally, women in rural India live with their in-laws and are expected to be the caretaker of their husband's family, including their children and his relatives. Adjusting to a completely unknown environment from that of their parent's house and meeting in-laws' expectations often subject women to many stressful situations. Hence the *social needs* of G2 included: maintaining social relationships with husband's relatives, keeping in touch with one's parents and relatives, contacting children's school teachers and mothers of children's classmates whenever necessary, and networking with co-workers at work. Due to their marital responsibilities, G2 pursued a higher number of social needs over their mobile phones compared to G1. In contrast, G1 living with their parents pursued a higher number of cognitive needs when compared to respondents from G2.

Mobile phones also help realize *cognitive needs,* which are psychologically oriented. G1 found mobile phones to be of special value when they felt lonely, when

they sought advice from friends for buying jewelry or cosmetics, when they called friends to plan a picnic, when they wished to hear a particular music album but did not know how to access the album, when they wanted to learn about opportunities for higher education, etc. The cognitive needs realized by G1 were mostly related and limited to themselves. In addition, due to fewer social and economic expectations for G1, they were free to spend their income as they wished. In contrast, G2 did not mention realizing and pursuing cognitive needs. This is understandable because in rural India, for a typical married woman, there are a number of activities, such as cooking, cleaning house, taking care of the children, keeping their husbands happy, and maintaining good relations with in-laws, which take precedence over spending time realizing cognitive needs.

Female participants' primary sources of income explain the variation in their *economic needs*. Although G1 and G2 had the same part-time employment at MGU, the respondents in the two groups had different types of part-time employment outside of MGU. Educational opportunities and exposure to English opened skill-based job opportunities for G1 in local firms. In contrast, members of G2 were engaged in capital-based, family-run businesses that sold bread, kerosene, homemade flours and spices, vegetables, bangles and other jewelry, traditional clothing, milk, and utensils. It is important to note that despite drawing income from a variety of sources, no respondent earned daily wages of more than a dollar.

Due to cost of purchasing land and building new houses, which the families of the respondents could not afford, they lived in ancestral houses that were in remote locations. As a result, every time respondents needed to conduct everyday livelihood-

related transactions or meet somebody, they had to walk long distances, sometimes at odd hours and in unfavorable weather conditions. All the respondents suffered from this physical handicap, which the mobile phones helped alleviate.

Step 3. Operating Mobile Phones and Exploiting their Functionalities

Both groups had different levels of expertise for operating mobile phones and exploiting their functionalities. G2 reported feeling little confidence (in the range of 0 to 2 on a scale of 10, with 10 being the highest) in using mobile phones for the first time (see Figure 2). Members of G2 represent older generation of women who were brought up with a norm that technology is for men. They also had a fear of spoiling their mobile phones by pressing wrong buttons. In contrast, G1, who belong to a younger generation, had very high confidence in their abilities to use the technology (in the range of 8 to 10). As a result, G1 used mobile phones extensively for deriving a variety of benefits explained later; in contrast, low-levels of confidence severely constrained the mobile phone usage by G2.

[Insert Figure 2 here]
Figure 2. Differences in Confidence Levels between G1 and G2

Preferred Language.

English, a foreign language, acted as a barrier for G2. Since all G2 (n = 30) respondents could not read and/or understand English, they did not feel comfortable or confident in exploring various information-seeking and information-searching features offered on their mobile phones. For instance, to access information on radio and communicate it via text messaging, users needed to select at least two to three choices on their mobile phones. Even for making calls to seek information, the respondents

needed to press numbers on the mobile phone; again, numbers printed in English made it difficult for them to reach out to someone when seeking information. Thus respondents' lack of literacy in English, which was the only language on their mobile phone, was a barrier for actively searching and seeking information over these devices. G2 preferred Hindi (national language) or Marathi (native language) on their mobile phones. In contrast, G1 did not report having any problem with English on their phone.

Use of Text Messages.

Eighty-three percent of G2, i.e. 25 respondents, used their mobile phones for voice communication only, whereas all G1 utilized the SMS text modality, as they were familiar with the English alphabet and numerals. They had benefitted from the introduction after 2000 of English in primary education even in government schools. Hence, G1 respondents, including those who had dropped out of school after the third or the fourth grade, had acquired rudimentary knowledge of English. This familiarity with English gave them confidence to use the text messaging feature on mobile phones.

Given the quasi-oral nature of texting (Baron 1998; Baron and Ling 2003), it emerges as a potential outlet for more authentic forms of expression and participation in the language of everyday speech (Street 2001). G1 respondents enjoyed using texting, a cheaper mode of communication compared to voice communication, for expressing themselves freely and frequently. In contrast, members of G2 had to rely on voice communication, which was affected by people/family members overhearing respondents' conversations with others. That effectively ended up compromising their private space. In accordance with He's (2008) observation that text messaging also

plays a critical role as a quasi-mass communication channel, G1 respondents reported texting information about organizing picnics to their entire group of friends. However, this capability was out of reach for G2.

Step 4. Seeking and Searching Information over Mobile Phones

The use of ICT plays a pivotal role in broadening access to and use of information (Narayan 2002). G2 used mobile phones mainly for receiving incoming calls. Many of them only knew how to press buttons for receiving calls. Due to their lack of familiarity with English, G2 could not make calls actively or compose text messages. They relied mainly on passive ways of receiving information. In contrast, G1 actively sought out and searched information over mobile phones. Thus the necessity of using a foreign language for operating mobile phones negatively affected G2 when seeking and searching for information over their devices. For example, Bharati, who was married for 27 years, received different types of information from various sources on her mobile phone.

> We get a lot of information using mobile and it has great benefits. Our relatives and I prepare *papad* and *kurdaee* [traditional Indian snacks], and I receive calls regarding that. I prepare and sell those items to my customers regularly. Also, if there is anything else happening, I get to know about it from others on my mobile. For example, if someone dies, I can be immediately informed on mobile. People can't travel all the way here, so they inform me on the phone....

Thus, without actively initiating any search, Bharati received information from her customers, relatives, and friends. She made use of that information for social and economic purposes. In contrast, Nipsi, an unmarried woman who did not even have a

fixed telephone system or landline telephone system, sought to fulfill her information needs through a mobile phone. She said:

> We did not even have landline in early days. Not any other phone as well. Hence, I bought a mobile for myself.

After making an application for the landline phone service, it typically takes months to get a fixed phone line installed in India due to the long waiting period. Beyond bureaucratic delay in the approval of applications, subscribers of landline service often have to bribe officers and linemen for keeping the service up-and-running, and they also have to bear up with uncertainty of service in the rainy season. In contrast, customers can get their mobile phone number and service activated on the same day they make an application. Moreover, mobile phones are more accessible and convenient to use than landline phones. More than 50% of G1 (n = 7) did not have any prior experience using a landline phone before they decided to buy a mobile phone; in keeping with the pattern in rural India.

G1 searched information actively, i.e. they were engaged in ongoing search activities that cumulatively built of earlier searches (Wilson 1997, 2000). In contrast, in case of passive receipt of information, the information a person receives (like members of G2) varies with the understandings and priorities of the sender rather than the recipient herself (Wilson 1997). G1 relied on information collected from friends and colleagues at work, whereas family formed the main source of information for women from G2.

The part-time employment at MGU provided all the respondents several face-to-face opportunities for seeking, searching, and sharing information regarding current issues in their community. The respondents met old friends, made new friends, and got acquainted with family situations beyond their own. The mobile phone enabled them to continue tapping into their social network at work. However, gathering and acquiring information does not guarantee the processing of information. For instance, an illiterate user might not be able to make use of information appearing in a newspaper. Hence, it was critical for the respondents to overcome barriers for processing information so that they could use it for deriving benefits.

Step 5. Overcoming Barriers

Both groups faced human and technical barriers for receiving, processing, and applying information acquired over mobile phones. For the most part, both the groups were successful in overcoming the barriers.

Human Barriers.

Lata (G2, married for 24 years), pointed to the ways that mobile communications could potentially be harmful, saying:

> I receive unwanted calls from unwanted people. They talk dirty. Now if I had a young daughter at home, she would get influenced badly due to such dirty people and their dirty talks on mobile. You see, people get spoiled in youth. So mobile has to be used properly.

Some people spread rumors regarding the usage of mobile phones. Such misinformation led to confusion, doubts, and fear for Shalan (G2, married for 24 years).

> In the past, people scared me for using mobile. They told me that weird sounds could come from the mobile, or it could burst anytime, so I was afraid of using my mobile. Some people also used to say, never pick up your phone when red light is on. I used to be tensed while picking up calls on my mobile. All kids used to say that never pick up calls when red light is on. So I used to be scared and in dilemma about whether to attend a phone call or not.

Consequently, despite having invested in a mobile phone, Shalan reported that at first she could not use her mobile phone even in the time of need because of this deep mistrust of mobile phones and her low confidence in her ability to operate it. After she got over her fears and she started using her mobile phone, her daily talk-time average was 17 minutes, which was 70% more than the average reported by G2.

Prachi (G1) worried about the social problems mobile phones could create for women in a small rural community like Bhor.

> If my number goes to any strangers and if they have any information about me, then they can bring me into trouble. Although it has never happened like that before … Some people are really sick, they have bad mentality of teasing women by calling them frequently.

In a male-dominant culture, men in the families (e.g., father, brother, uncle) feel responsible for protecting the women from outsiders. Since mobile phones open up a channel of communication for outside strangers, male relatives discouraged GI, often adamantly, from owning and using mobile phones.

More than half of the respondents from each group (n = 7 for G1 and n = 17 for G2) talked about some human barrier or another.

Technical Barriers.

Technological infrastructure and mobile phone designs and interfaces formed barriers to all the respondents' facility in using mobile phones. Electricity is basic to Internet access and ICT use, but a third of Indians do not have access to electricity, and those who have access cannot rely on it. Due to the intermittent supply of electricity, Sushila could not charge her mobile phone anytime she wanted.

> Every day, we have electricity for only 6 to 7 hours. I charge my mobile during that period. If the electricity is unavailable in the mornings, it comes back in the evenings, and vice versa. So during that short period, I charge my mobile.

In 2010, Vodafone Essar Ltd. introduced a solar powered mobile phone (VF 247) in India (Yan 2010). This solar powered phone, priced at $32, is expected to remove the technical barrier Sushila described.

Designs and interfaces of mobile phones also create technical problems for their users. Due to unfriendly keypads when typing SMS in Marathi, Gouri (G1) could not use text messaging in Marathi, despite having the desire to do so.

> I would like to have Marathi on my mobile rather than English, because Marathi is my mother-tongue. I have Marathi on my mobile. It is "in-built" in my machine. But the problem is "Marathi typing" is troublesome to use, since we are used to English for "daily routine." Marathi typing is difficult, so mostly English is used (for SMS).

Range and strength of mobile signals also were technical barriers for women living at the bottom of hills near Bhor, as noted by Sushila:

> Many a times it happens that relatives call me and range does not reach here.

In order to make a call, she often climbed up the ladder leading to roof of her house. After punching numbers on the mobile phone, she raised her other hand up in the air. Once the call connected, she came down. Then, usually, the signal was not lost. These antics, verging on the comical, are common for people trying to cope with inadequate network.

Step 6. Deriving Benefits by Satisfying Information Needs

While respondents reported using mobile phones for personal, family-related, and other reasons, income-earning activities were the main drivers of mobile phone use (see Figure 3 below). G2 reported employment and keeping in touch with immediate family members (e.g., husband and children) as the two topmost reasons for using mobile phones. G1 identified employment and safety and security as the two topmost reasons for using mobile phones. G2 communicated the most with their husbands and children, mainly for employment-related issues. In contrast, G1 talked the most with friends at work and female relatives to consult for employment, safety, and security-related issues. Although employment was the primary purpose of using mobile phones, both the groups relied on different sources of information.

[Insert Figure 3 here]

Figure 3. How Do Respondents Benefit from the Use of Mobile Phones?

At MGU it was mandatory for them to report their availability in advance to the management on the day prior to working. Respondents could confirm their appointments with their mobile phones, instead of walking over to MGU. The mobile phone also enabled women to travel to distant towns to sell handicraft items and similar products and still maintain contact with their families and secure their assistance in case of an emergency.[4]

"Steps for Using Information to Derive Benefits" (see Figure 4) is offered as a synthesis of the above-discussed findings. The feedback loop indicates that women realize a variety of context-specific information needs that prompts use of mobile phones and the subsequent process feeds back into their life context and thereby subsequent information search cycles.

[Insert Figure 4 Here]
Figure 4. Steps for Using Information to Derive Benefits

Since the steps are based on the experiences shared by a small sample of respondents using mobile phones for around a year, they may not be applicable to the digital inclusion experienced by all disadvantaged women using mobile phones in other parts of the world.

CONCLUSIONS & IMPLICATIONS

Poor female mobile phone users, whose opinions are rarely sought, appreciated that in the course of the interviews for this study they were asked to reflect upon their lives and share their thoughts. They were thrilled to see their answers put down on paper. With regard to mobile phones, their tone and word choice suggested that they had a sense of growth with their newfound capability to communicate and access information.

Their information needs and access to information acted as two key antecedents for use of information to derive benefits. Hence key findings have been summarized into the following three clusters – Information Needs, Access to Information, and Use of Information.

1. Information Needs

a. Information needs realized either by themselves or people around them in a specific context inspired the women to use mobile phones. In effect, the mobile phones use was driven by information needs. This finding resonates with Hafkin's (2002) observation – If ICTs are to be useful to disadvantaged women, they must meet the information needs of the women in a form they can use; otherwise the ICTs remain of little interest and value to the women.
b. Information needs of the respondents arose out of a set of primary needs in their everyday life.
c. Participants did not think of information as something separate from the task or problem at hand.
d. While the information needs of G2 were in reference to their families, the needs of G1 were centered on themselves. This suggests that information needs are a function of the social context within which an individual is situated.

2. Access to Information (Information Seeking and Searching)

e. Information skills play a critical role in empowering female mobile phone users to derive benefits from information.
f. The source of information was the only factor that influenced the respondents' trust in information they seek.
g. Participants from G1 exhibited active information-seeking and information-searching behavior, whereas G2 relied mainly on passive way of seeking information. However, for both the groups, husbands, parents, children, and other women at work served as gatekeepers of information.

3. Use of Information

h. Barriers experienced by the respondents for using information can be grouped into the following three clusters: Subjective norms (e.g., discouragement from friends and family members); cultural barriers (e.g., rumors regarding use of mobile phones, poor customer service delaying the activation of mobile phones); and technical barriers (e.g., intermittent supply of electricity, low signal strength).
i. Women also experienced a few unintended consequences of using mobile phones such as harassing calls.
j. Respondents experienced several direct and a few indirect benefits from using information communicated over mobile phones.
k. Benefits derived from the use of information incentivized respondents to continue using their mobile phones.
l. Digital inclusion of disadvantaged women often plays a pivotal role in expanding freedom of choice and action to shape their lives, also known as empowerment, which helps them to make free choices and craft new identities for themselves.

This study advances our understanding of the role of *use of information* in digital inclusion of disadvantaged populations in developing nations. ICT users can benefit from digital inclusion only when they are able to satisfy their context-specific information needs. It is therefore important to understand the entire process of information use. The stages in the information use process identified by this study are likely to prompt further research on information use.

Notes

[1] Total population of India is around 1.2 billion.

[2] Here it is worth noting that digital divide researchers have started taking a process-oriented perspective (Barzilai-Nahon 2006; Lenhart and Horrigan 2003; Meredyth and Thomas 2002; Warschauer 2002; Warschauer 2003).

[3] Information behavior is defined as the many ways in which humans interact with information, especially the ways in which people seek and utilize information (Bates 2010). In effect, *Information behavior* encompasses both access to information and use of information, which more comprehensively can be described as follows:

> The totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use. It includes face-to-face communication with others, as well as the passive reception of information as in, for example, watching TV advertisements without any intention to act on the information given (Wilson 2000, 49).

[4] These findings contradict those of several studies (Huyer et al. 2006; Ling 1998; Ling 2004), which reported that poor women use mobile phones mostly for personal and social reasons alone and not for professional or work-related reasons.

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Table 1. Analytical Process used to Derive "Overcoming Barriers" Step

Selected data points – *Open Coding*	**Clustering of data points – *Axial Coding***	***Selective Coding* – "Overcoming Barriers" Step**
Harmful and/or profane calls made by strangers	Human Barriers to Receiving Information	Overcoming Barriers to Receiving, Processing, and Using Information
Opposition/resistance by in-laws, male family members, or other relatives for using mobile phones		
Rumors about mobile phones causing health problems	Human Barriers to Applying Information for Deriving Benefits	
Social tendency of others to create problems for women who use mobile phones		
Lack of electricity to charge mobile phones	Technical Barriers to Receiving and Processing Information	
Weak signal strength causing frequent call drops		
Inability to use "text messaging" feature offered in English	Technical Barrier to Processing Information	

Figure 1. Simplified Version of Global Model of Human Information Behavior
(See Wilson (1997) for Original Model)

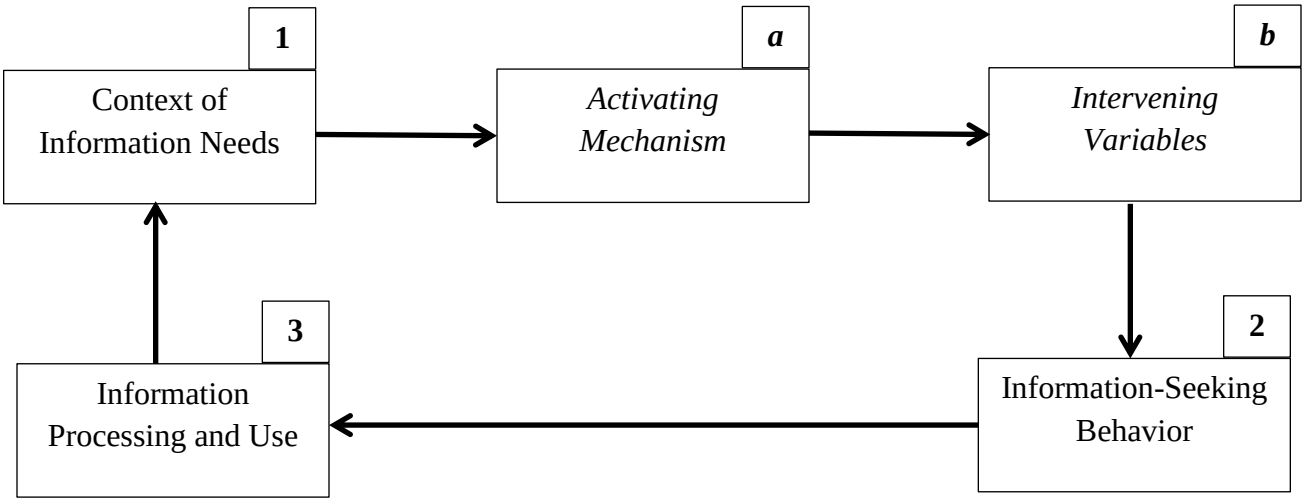

Figure 2. Differences in Confidence Levels between G1 and G2

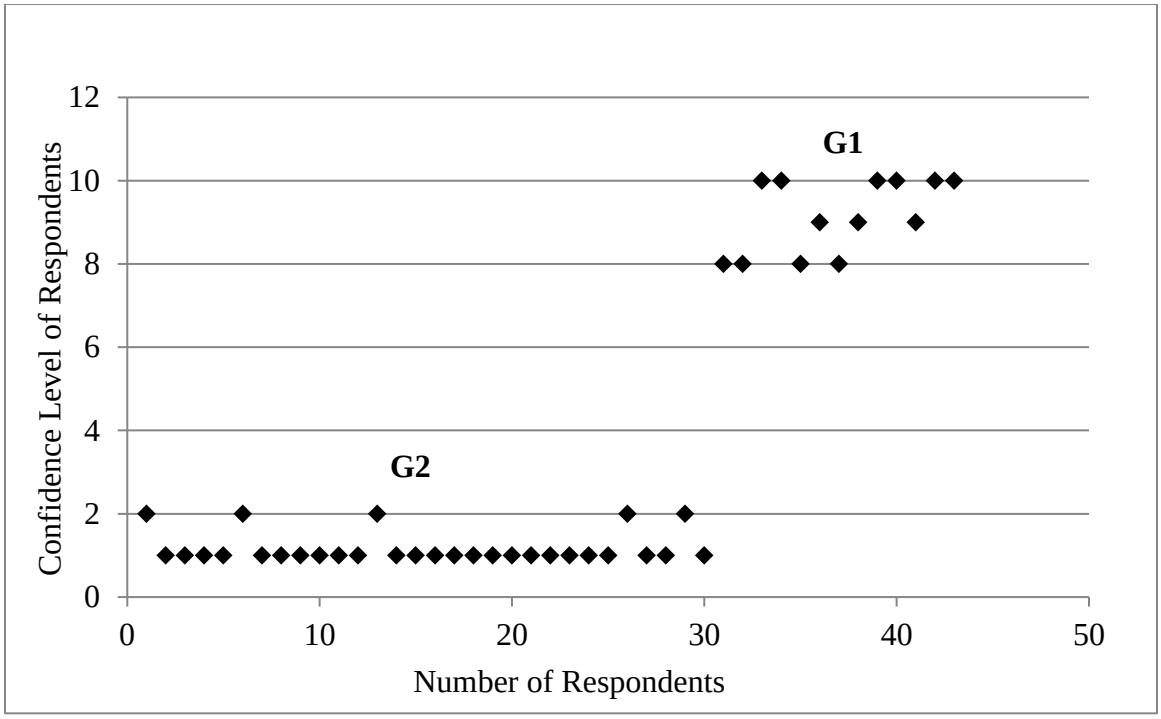

Figure 3. How Do Respondents Benefit from the Use of Mobile Phones?

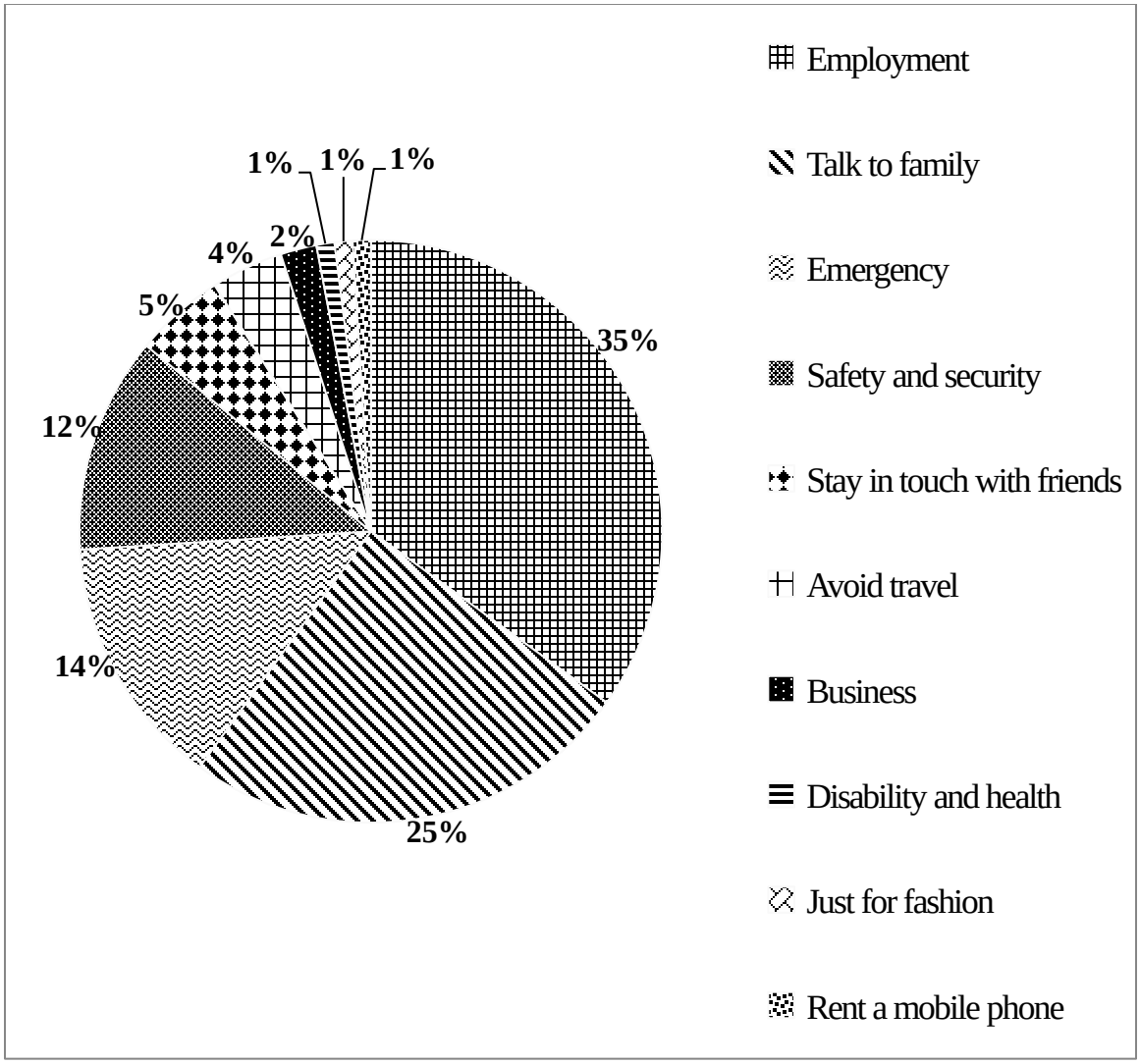

Figure 4. Steps for Using Information to Derive Benefits