Feeling Proud, Feeling Embarrassed: Experiences of Low-income Women with Crowd Work

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ABSTRACT

Women's economic empowerment is central to gender equality. However, work opportunities available to low-income women in patriarchal societies are infrequent. While crowd work has the potential to increase labor participation of such women, much remains unknown about their engagement with crowd work and the resultant opportunities and tensions. To fill this gap, we critically examined the adoption and use of a crowd work platform by low-income women in India. Through a qualitative study, we found that women faced tremendous challenges, for example, in seeking permission from family members to do crowd work, lack of family support and encouragement, and often working in unfavorable environments where they had to hide their work lives. While crowd work took a toll on their physical and emotional wellbeing, it also led to increased confidence, agency, and autonomy. We discuss ways to reduce frictions and tensions in participation of low-income women on crowd work platforms.

CCS CONCEPTS

• **Human-centered computing → Empirical studies in HCI**.

KEYWORDS

Women, crowd work, HCI4D, crowdsourcing app, crowdsourcing work, mobile crowdsourcing

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1 INTRODUCTION

Women routinely experience inequality and discrimination in all walks of life, including access to education [10], healthcare [49], and employment opportunities [29]. These gaps are more pronounced in low-income regions in the Global South where many women live in strong patriarchal systems that limit their voice, agency, mobility, and autonomy [68, 72, 85]. Although women's economic empowerment has been shown to reduce gender gaps, their labor force participation continues to remain low because of barriers like low levels of education [65], unpaid care work and domestic duties [9], and long work hours [93]. In India, the focus of our study, female labor participation is the lowest in South Asia, with four out of five women not engaged in the labor force [56].

With the increase in popularity of crowd work platforms, women who earlier struggled to take up traditional and normative forms of work have found a renewed hope. Many crowd work platforms, such as Amazon Mechanical Turk (MTurk) and CrowdFlower, provide remote and flexible freelance work opportunities that are extremely attractive for women who have to balance work with busy domestic schedules that they have little direct control on. In fact, around 35% MTurk workers in India and 55% in the US are women [24]. Despite crowd work's popularity and its potential fit with women's lives, only a few studies have examined women's engagement with crowd work and reported how they routinely experience microaggressions and discrimination, in the form of lower ratings, unequal wages, fewer reviews, and unfavorable perceptions compared to men. While these studies enrich our understanding of the adversities women face on crowd work platforms, they only describe viewpoints and experiences of women in Western contexts, who arguably have more agency and autonomy than their counterparts in the Global South. As a result, much remains unknown about how low-income women in strong patriarchal systems in the Global South engage with crowd work and the extent to which crowd work meets their individual needs and professional aspirations.

To fill this critical gap, we examine how low-income women engage with crowd work on Karya, a microtasking platform that is designed for low-income, digitally-novice communities in India. Specifically, we focus our investigation on crowd work done by women for Readit, a requester on Karya which launched a series of microtasks to collect speech data in local languages. Through interviews with sixteen low-income women, we examine their motivations to join crowd work, work practices and routines, and

the resulting challenges and impacts. To identify how gender shapes the adoption and engagement with crowd work, we also conduct interviews with twelve low-income men to compare and contrast their work practices and aspirations with those of women.

Our findings show that low-income women experienced substantial challenges in adopting and engaging with crowd work. From the start, women from homes with deep-rooted patriarchal norms were worried about the disruptions crowd work might present to their domestic duties as well as reputational and financial risks it might entail. However, encouragement from other women workers and scaffolding from on-ground staff encouraged women to take up crowd work in pursuit of their financial and professional aspirations. Women had to invest substantial time and efforts in convincing their male family members about the safety of crowd work and that it would not impact their household duties. Despite getting permission from their families to engage in crowd work, they routinely received criticism, ridicule, and disruptions. Although these challenges resulted in a toll on women's physical and emotional wellbeing, earnings from crowd work provided them with a sense of increased agency and independence, improved their self-worth and confidence, and encouraged them to pursue other forms of work.

We analyze our findings to show how strong-trust networks formed by women workers played a key role in improving women's wellbeing and giving them a sense of solidarity as they dealt with the challenges emerging from the crowd work. We also offer concrete design recommendations to address key tensions and vulnerabilities to make crowd work platforms more welcoming and accessible to low-income women living in strong patriarchal systems in the Global South. In doing so, we make important contributions to the work at the nexus of gender and future of work:

(1) We provide a comprehensive understanding of how low-income women adopt and use crowd work platforms in the Global South and the resulting benefits and tensions that emerge from this engagement.
(2) We explicate how in contrast to men, women's work aspirations clash with patriarchal norms and realities when they engage with crowd work.
(3) We discuss ethical guidelines and concrete recommendations to design future crowd work platforms that have a potential to empower women crowd workers in low-income communities.

2 RELATED WORK

2.1 Gender and Work

Women in low-income communities in the Global South often live in strong patriarchal communities, where they have limited agency and lack opportunities for self-empowerment [68, 72, 85]. There are glaring gender gaps in access to education, healthcare, and employment [10, 29, 49]. Although women's economic empowerment has been shown to improve gender equality and several developmental outcomes [3], their labor force participation continues to remain low and has stagnated over the last two decades [1]. In South Asia, the female labor participation rate is only 24% compared to 80% for men [9]. There are several barriers that contribute to their limited participation, such as low levels of education, societal norms that limit their mobility, and domestic duties, among others [9].

Even when women are a part of the workforce, they experience several challenges, such as limited resources [64], unequal pay [82], lack of support and encouragement [51], long and irregular work hours [93], workplace harassment [76], and frequent disruptions due to unforeseen family circumstances [17]. These challenges impact the labor participation of women much more than men, often making it difficult for women to take up different forms of work. Take the case of the COVID-19 pandemic, during which rural women in India accounted for nearly 80% of job losses [2]. Within informal work sector, women workers experienced severe income drop, with an increased responsibility of managing house chores and family affairs [17]. In case of domestic work, large proportion of women experienced reduced work hours in their employment accompanied by lack of substantial payment [69].

Recent years have seen a dramatic surge in "future of work" platforms that offer new forms of work to people who struggle to take up traditional and normative forms of work. Most popular among them are crowdsourcing marketplaces—such as Amazon Mechanical Turk (MTurk), Crowd Flower, and Upwork—that provide remote and flexible work opportunities to people worldwide. Crowdsourced work (or crowd work) is a form of remote work that compensates people to complete small, manageable pieces of work that are time-sensitive, and are "outsourced" to a large group of geographically-distributed workers [44]. These tasks often include taking up surveys, tagging images and keywords, and translating and transcribing content, that add up to a few dollars an hour of wages for experienced workers [50]. Over the last few years, tens of millions of people all across the world have gravitated towards these platforms [45] for benefits like flexible work hours, lack of long-term commitment, and manageable tasks [14, 22, 45]. These benefits make these platforms especially appealing to women who are unable to join the traditional forms of work due to multiple deprivations and constraints [31].

The unprecedented rise of crowd work has motivated many HCI scholars to critically examine these platforms, including understanding the lived experiences of crowd workers and analyzing the underlying algorithmic and bureaucratic management practices. Several scholars have pointed out how crowdsourcing marketplaces are empowering people by providing novel work opportunities to those who struggle to take up the traditional forms of work. For example, Zyskowski et al. [101] showed that people with a variety of disabilities participate on MTurk because of the benefits that the normative office environments seldom provide, such as job flexibility and lack of a need to rely on public transport. Scholars have also identified critical issues that make crowd workers vulnerable on these platforms. For example, workers often earn money based on their *output* rather than the *time* they invest in doing the work (piecework approach [6]). They are often either paid in full or nothing, resulting in loss of wages when their work is not approved by requesters. The nature of crowd work itself also makes the workers invisible and their contributions unknown, leading to "ghost work" [38]. Scholars have also uncovered issues of anxiety and depression among crowd workers [92], and referred to crowd work as a *"poorly paid hell"* [81].

Despite the popularity of crowdsourcing marketplaces and the rising debates around their potentials and pitfalls, only a few studies have explored gendered aspects of crowd work [32, 42, 53]. Scholars have found that women experience discrimination on these platforms. For example, Hannák et al. [42] showed that women on Fiverr and TaskRabbit received fewer reviews than men, and Black women were less likely to be described with positive adjectives. Jahanbakhsh et al. [53] examined how online workers' ratings were impacted by their gender and found that low-performing women were given lower ratings than men. Similarly, Foong and colleagues [31, 32] found that women on Upwork asked for lower money when setting bill rates for themselves. Formless nature of such work further contributes to the blurring of boundaries between work and home ([8, 19, 37, 99]), adding to women's stress and burden.

Although these studies paint a troubling picture of the challenges that women experience on crowdsourcing platforms, all the work described thus far focuses on women who live in the West, who arguably have more agency and autonomy than low-income women living in patriarchal systems in the Global South [85]. Little is known about the role gender plays in the adoption and use of crowd work platforms in low-income, deeply-patriarchal communities and the opportunities and tensions that arise when women in these communities engage with crowd work. Our work contributes to this nascent, but important body of work, by describing the lived experiences of low-income women in India who live in staunchly patriarchal systems and are new to crowd work. We now describe research focused specifically on crowdsourcing platforms for low-income communities in the Global South.

2.2 Crowdsourcing Platforms for Low-Income Communities in the Global South

Crowdsourcing marketplaces have received a massive uptake in the Global South. For example, India, the focus of our study, has the second highest numbers of workers on MTurk, second only to the United States [25]. Several scholars have studied the use of crowd work platforms by people in developing regions. For example, Wood et al. [100] examined the job quality of work in the remote gig economy and found that though crowd work offered workers high levels of flexibility and autonomy, it also resulted in low-wages, social isolation, overwork, and sleep deprivation. Along the same lines, Webster [98] noted the precarity of crowd work and how it forced crowd workers in developing regions to compete with each other, driving down the wages they could command. Scholars have also shown how people in the Global South struggled to perform tasks on these platforms. For example, Gray et al. [39] found that MTurk workers in India grappled with culturally-specific knowledge and references to popular culture in survey tasks, making it difficult for them to complete even the most mundane tasks. Similarly, Khanna et al. [57] found that low-literate MTurk workers in India struggled to navigate user interfaces and understand task instructions. Over the years, a growing number of scholars have questioned *who* gets the opportunity to engage in the crowd work, suggesting that crowdsourcing platforms are ableist and classist, and are designed for urban and affluent communities in the West [15, 26, 27, 101]. For example, Vashistha et al. [95] highlighted how crowdsourcing platforms currently exclude people in developing regions who are low-literate, speak only local languages, and lack access to Internet-connected devices.

In response to these concerns, several HCI4D scholars and practitioners have built new crowdsourcing platforms to make crowd work opportunities accessible to low-income, low-literate people who lack access to Internet-connected devices in the Global South [18, 40, 74, 95, 95, 96]. For example, txtEagle [30] enables low-income people to complete surveys sent over text messages, mClerk [40] and MobileWorks [67] let people transcribe images sent to their phones via multimedia messaging service, and ReCall [95] and Karamad [74] use Interactive Voice Response (IVR) technology to enable people to do transcription tasks over phone calls. With the recent surge of smartphones in developing countries and plummeting costs of data, several new smartphone-based platforms have come up containing simple user interface and tasks utilizing local language skills [18, 55, 96]. For example, Respeak [96] and BSpeak [97] enable people to complete speech transcription tasks and Karya [18] pays people to digitize hand-written Devanagari script documents. Not only are many of these platforms inclusive and accessible to a wide range of people previously excluded from crowd work (e.g., rural residents [95], people with visual impairments [97], basic phone users [40, 74, 95]), they also enable them to do contextually-relevant tasks [18, 96], improve their confidence and soft skills [96, 97], and earn supplemental income comparable to the average daily wage [18, 95, 97]. On the other hand, these platforms have been also shown to make crowd workers feel isolated, undervalued, and overworked [18, 40].

Most notably absent from these studies are experiences of low-income women with crowd work. None of the studies so far have examined how gender impacts the adoption and use of crowdsourcing platforms, rendering the voices and experiences of low-income women invisible. Only a few scholars have studied low-income women's experiences on on-demand, gig-economy platforms that aggregate beauticians and spa therapists for home service [7, 41, 75]. These studies have shown that while women experience greater risks (e.g., verbal and emotional abuse) when working on such platforms [41], they also leverage these platforms to negotiate their societal standing and gain agency [7].

Our work makes important contributions to this nascent, but important body of work by making visible the lived experiences of low-income women crowd workers from strong patriarchal societies. Our work is situated in settings where gender inequality manifests greatly in the adoption, access, and use of ICTs [47, 52]. For example, women in South Asia are 38% less likely than men to own a mobile phone [4]. Even when they have access to phones, their usage is controlled by male family members who themselves enjoy unrestricted access to technology [48]. Such gendered differences in technology usage have led to several challenges for women [62], including surveillance and lack of privacy [5, 28, 77], vulnerability to frauds and scams [66, 94], lack of agency [36, 73] and financial autonomy [47, 91], and threats to their wellbeing [59], among others. Our work presents the first in-depth account of how and why women living in such patriarchal structures engage with crowd work. In particular, we explore how low-income women workers establish trust; what motivates them to take up crowd

work; the challenges and characteristics of such work; and the kind of impact crowd work has had on their lives.

3 KARYA: CROWD WORK PLATFORM FOR LOW-INCOME COMMUNITIES

To understand the experiences of women on crowd work platforms, we partnered with Readit[1], a requester who deployed microtasks on the crowd work platform called Karya. In this section, we briefly describe the specifics of Karya platform and Readit. Karya is a smartphone-based microtasking platform that provides accessible crowd work opportunities to low-income communities. The platform provides requesters an opportunity to deploy a wide-array of microtasks on low-cost smartphones, with minimum data connectivity requirements, making it easier for workers from low-income communities to participate. To provide a comfortable working experience, the app also provides a few accessibility features, such as enabling workers to view the app in their local language (figure 1.B) and an integrated audio assistant that narrates the responsibilities and interaction options for each screen of the app (icon in the top right, figure 1.B).

3.1 Speech Data Collection By Readit

Readit's objective was to collect speech data for four lesser known dialects of Odia, a language spoken in Odisha, a state located in Eastern India. Readit's speech data collection on the Karya platform started with Readit building a corpus of sentences across three domains: (1) health (e.g.,*"My periods have stopped since two months, I have tested positive"*), (2) banking (*e.g.,"I have a lot of money to send. How much money can I send online at once?"*), and (3) agriculture (*e.g.,"How much does it cost to harvest rice per acre?"*). This sentence corpus was then uploaded as microtasks and recording each sentence was considered completion of one microtask. Readit, with the help of on-ground staff, advertised Karya platform and Readit's microtasks in diverse low-income communities within five districts of Odisha while balancing for gender, age group, and dialects. Interested individuals reached out to Readit's on-site staff who asked them basic screening questions, such as their reading abilities, possession of a bank account, and smartphone and internet access. Shortlisted participants were sent a Play Store link to the Karya application. Once participants downloaded and registered on the platform, they had to complete an IRB consent form. They were also walked through the best practices, such as taking frequent breaks, and working on the app for limited hours, among others. To complete a microtask, participants had to record the sentence displayed on the screen (see figure 1.C). Each excerpt took anywhere between five to fifteen seconds to record, based on the length. They had to record themselves speaking out the sentences one at a time. Once they completed recording all the sentences in the task, they received the next task. Finally, all the recordings provided by the participants were validated for accuracy. Based on the validation, participants' earnings were updated on their home screen (see bottom portion of the figure 1.B). Readit paid the participants via their bank accounts on a weekly basis. Overall, all the participants had to complete 3,660 microtasks (sentences) and participants were paid INR 1 for each correctly recorded sentence. In other words each participant could make up to INR 3,660 (USD 37) by completing all the tasks. In total, Readit recruited 243 men and 231 women that completed at least one microtask. Participants had the option to leave the platform at anytime with the earnings they procured from their recorded tasks. Average duration of Karya use for female interviewees was 20 days (min=5, max=41, S.D.=11.05) while male interviewees was 17 days (min=3, max=38, S.D=9.68). Readit also provided in-person support through their on-ground partners to resolve any issues that may arise during the deployment.

[1]Name Anonymized

4 METHODS

We now describe our IRB-approved, four-month long research study with a subset of workers that Readit recruited on Karya (March-June, 2021). The study involved interviewing 32 workers. All the interactions were conducted remotely due to the COVID-19 pandemic.

Recruitment. For our interviews, we used quota sampling to select the participants from the pool of crowd workers. With the help of Readit, we reached out to the workers in all five districts. In the process, we recruited three types of interviewees, (1) workers who had completed all the Readit's microtasks on the Karya platform (completed), (2) workers who were actively completing their microtasks regularly (active), and (3) workers who registered on Karya platform, but stopped working (stopped). Readit provided us with a list of workers while balancing for gender, age, and location. We reached out to the participants at random and explained the purpose of the study. We scheduled an appropriate date and time for an interview with 16 women who expressed an interest in our study. To contrast the women's practices, we also recruited 12 men. We also interviewed four on-ground and on-site staff of Readit who actively engaged with the participants during onboarding, management, and support.

Procedure. Due to COVID-19 pandemic, we developed a remote interview protocol. All the conversations happened on a phone call as it was the most convenient form of conversation for the participants. A brief pre-interview call was set-up to inquire about the participant's health and wellbeing, their availability for the call, and to walk them through the expectations of the interview. In case of any concern, we provided participants the option to cancel or reschedule the call at any time during the study. The interview protocol was divided into four sections. We started with questions around access to Karya platform and their generic Karya use (e.g., "*How were you introduced to Karya?*"), then we inquired how their Karya work was recognized and perceived by other individuals, such as family members ("*What was your family's biggest complaint when you were using Karya?*"), and ended with questions around benefits and challenges in working on Karya ("*What kind of obstacles did you face in your household chores while working on Karya in parallel?*"). We conducted the interviews in Hindi and Odia, depending on the interviewee's comfort. Interviews lasted an average of 75 minutes (min=45 minutes, max= 102 minutes).

Participants Demographics. Most of the 16 women participants in the study were housewives. The remaining few women worked full-time as a tailor, shop-worker, caterer, and community health

Crowd Workers (n=28)		
Gender	Women: 16	Men: 12
Age (yrs)	Min: 18, Max: 44, Avg: 30, SD: 7.5	Min: 19, Max: 60, Avg: 36, SD: 10.21
User type	Completed: 7, Active: 5, Stopped: 4	Completed: 4, Active: 3, Stopped: 5
Education	Secondary school: 3, High school: 8, Graduate: 4, Post graduate: 1	High school: 4, Bachelor's: 4, Master's: 4
Area	Puri: 1, Sambalpur: 4, Koraput: 3, Raghurajpur: 5, Mayubanj: 3	Puri: 1, Sambalpur: 2, Koraput: 3, Raghurajpur: 4, Mayubanj: 2
Family count	Min: 3, Max: 7, Avg: 5, SD: 1.38	Min: 2, Max: 5, Avg: 4, SD: 1.13
Language (Read and write)	Basic English: 1, Hindi: 11, Odiya: 15	Basic English: 4, Hindi: 10, Odiya: 11
Personal Status	Employed: 5, Unemployed: 2, Never employed: 9	Employed: 8, Unemployed: 3, Never employed: 1
Personal Income (Rupees)	Min: 4,500, Max: 14,000, Median: 8,600, SD: 3,153.62	Min: 7,000, Max: 30,500, Median: 14,000, SD: 6,814.88
Smartphone ownership	Own personally: 3, Own & share: 8, Only share: 5	Own personally: 10, Own & share: 2, Only share: 0
Technology use	Work: 3, Entertainment: 14, Communication: 16	Work: 7, Entertainment: 11, Communication: 12
Staff (n=4)		
Gender	Women: 2	Men: 2
Age (yrs)	Min: 20, Max: 22, Avg: 21	Min: 49, Max: 52, Avg: 50
Work Experience (yrs)	Min: 1, Max: 2, Avg: 1.5	Min: 16, Max: 21, Avg: 18.5

Table 1: Demographic details of low-income women and men workers recruited for the Interview

worker. Table-1 shows the demographic information of our participants in detail. Only one woman who had completed her post graduation, knew how to speak and write in English. Rest of the women participants only spoke Hindi and Odia. On a typical day, women reported working for an average of eight hours in domestic chores, eight hours in professional work (if employed), and three hours of leisure time for one's self. Only three women owned smartphones, while 13 of them shared their devices with their families to varying extent. On the other hand, out of the 12 men we interviewed, the majority were employed in a full-time job. We also had a few participants who lost their job during the COVID-19 pandemic. Unlike women, the majority of the men (n=8) had completed their graduation. Several men also knew how to read and write in English (n=6), in addition to Hindi and Odia language. On a typical day, men reported spending three hours in household chores, nine hours in professional work (if employed), and four hours of leisure time for one's self. Only two men had to share their smartphones with other members of their house.

We also had four Readit on-ground (two men) and on-site (two women) staff members. On-ground men were working in an NGO with an average of more than 15 years of experience, while women were in junior positions with an average of three years of experience. All staff members were graduates.

Data Collection and Analysis. We collected in total 33.2 hours of interview data. All the interviews were audio recorded in respective local languages, translated into English language, and then transcribed. Subsequently, we engaged in qualitative coding using inductive thematic analysis in MAXQDA software[20]. We began by taking multiple passes of our transcribed data to internalize the diverse interviewee accounts. Subsequently, we performed open-coding on transcribed data while avoiding any presupposed codes or theoretical assumptions, allowing codes to emerge at this point. Credibility was established through prolonged engagement with the data by all the authors over several weeks. Final codes were carefully chosen by the authors after merging the overlapping codes and discarding the duplicate ones. Important disagreements during this process were resolved through multiple rounds of peer-debriefing [21] with active participation from all the authors. Our final codebook consisted of 58 codes. Example codes included *'onus of establishing trust'*, *'improved societal image'*, *'controlled schedule'*, *'lack of privacy'*, and *'future vulnerabilities'*. Finally, we used an abductive approach [88] to further map, categorize, and structure the codes and translate them into appropriate themes. To achieve this, we took inspiration from Bardzell's feminist HCI framework [13]. Our example themes included *'motivations to take up crowd work'*, *'crowd work challenges'*, *'impact of crowd work on professional aspirations'*, among others. As our main research objective was to understand the overall engagement of women with crowd work, we categorized our resultant codes and themes into three main sections to reflect this: (1) workers' motivation to start crowd work, (2) their experiences of doing crowd work, and (3) the impact of such work on their broader lives.

Reflexivity. Our analysis and interpretation of the data is shaped by our research experience in the field of crowd work in the Global South. All authors are of Indian origin, with extensive experience in conducting field research with low-income communities in India. Two authors are women while the remaining three identify themselves as men. The interviews were conducted by the first author whose gender, education, and urbanity placed him in a position of power, especially with low-income women participants. To facilitate a comfortable environment, a woman field employee assisted the first author with recruitment and interviews. All the authors actively work in the space of future of work and are committed to studying equity issues that disproportionately impact women. We view HCI research from a lens of feminist computing [13], striving to understand the practices of women in work settings.

5 FINDINGS

Our findings are organized into three sections. We start by describing the women interviewees' motivations and the factors they consider when taking up crowd work on Karya. We then explore women workers' practices and the challenges they face as they carried out crowd work. We end by showing the overall impact of the Karya platform on these workers' lives. We also contrast these observations with those of men workers to examine the role gender plays in shaping the adoption and use of microtasking platforms.

5.1 Adopting Crowd Work

Concerns Around Reputation & Finance. Most of our women participants lived in strong patriarchal systems where their smartphone usage was often under surveillance of male family members. They repeatedly warned women of the personal harm and harassment that the Internet could bring. In this environment, they

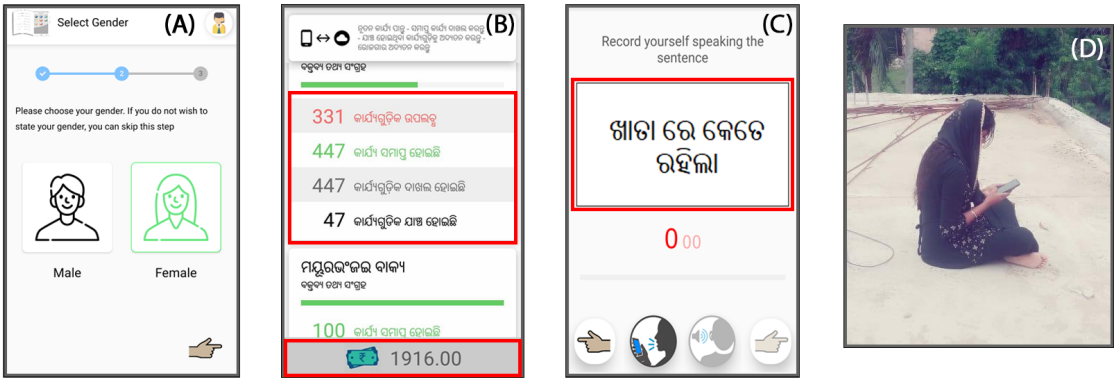

Figure 1: (A) (In English language) Registration screen asking workers to select their gender. Members could skip it, if they did not want to disclose. ; (B) (In Odia language) Karya app dashboard showing overall microtasks' progress. The screen reads, "331 Tasks available" (red), "447 tasks completed" (green), "447 tasks submitted" (grey), "47 tasks validated" (black); (C) Interface for recording a sentence; the sentence on the screen reads, "How much balance is left in the account"?; (D) A women worker recording sentences on her house terrace

were extremely concerned about the potential harm of using smartphones and the subsequent risks they posed to their family's reputation. As a result, they approached new technology applications like Karya with utmost caution as they feared it could potentially bring disrepute to them and their family. They had several concerns regarding crowd work that arose from their being unaware of such opportunities before and hence, had little understanding of the underlying processes. For instance, Laveena, a housewife, was extremely cautious engaging with the Karya application out of the fear of the unknown:

> *"I first came to know about this through my sister's daughter. When I asked, she said I should also join this work because it is a good utilization of time and a good way to earn some pocket money without needing to go out. I was quite skeptical because I had never heard of such jobs. I asked her, 'What is the risk? You know I live in a joint family. I have to think twice before doing anything'…She told me this is a new kind of work because of the COVID-19 pandemic. She assured me once she gets paid, she'll share with me and I can join then."*

To alleviate the safety concerns, women participants needed considerable convincing. Often, they relied on women in their social network who were already using Karya. These *experienced crowd workers* reached out to, and helped answer several concerns of the women participants. To a lesser extent, women participants also relied on the *on-ground staff* who were deployed by Karya to on-board potential participants. Interestingly, compared to the experienced crowd workers, on-ground staff struggled to reach out to and connect with women, partly because most of them were men, who did not have immediate in-person access to women. Instead, on-ground staff had to first interact with the men of the household to establish credibility and explain the functioning of Karya. Even when interested women directly reached out to them, they often requested them to get the approval of their fathers or husbands. Although they did that to follow community norms that expected them to keep male family members in the loop, it also meant that they reinforced the perception that women workers needed permission of their family members in order to engage in crowd work. In contrast, on-ground staff had direct access to men participants. In fact, in most cases (N=10), on-ground staff reached out to men and registered them on the Karya platform through WhatsApp and/or call.

Apart from reputational risks, women participants were also worried about the legitimacy of crowd work and online financial scams that they had heard of from their family members. To ease their concerns, both experienced workers and on-ground staff had to prove the legitimacy of the work on Karya through several means. This included sharing screenshots depicting the completed tasks, conversations with the on-site staff, screenshots of text messages showing the amount earned, and even onboarding their own family onto the platform to establish safety beyond doubt. Pavan, an on-ground staff with 16 years of non-profit experience, described how women were worried that providing bank account details for remittance could be misused to steal money from their accounts:

> *"I convinced three ladies in Koraput, they said 'Everybody assures us money but nobody actually pays'. I told them, 'We will definitely pay. If you don't trust us then I will give you contacts of women who completed work from Sambalpur'…Their biggest worry was that if they share their account details, somebody will steal all the money. I told them 'Give your kid's bank account or any account that does not have money.' Sometimes, I have to seriously challenge their claims."*

In contrast to women, on-ground staff felt that men were relatively more aware of financial fraud, asked for less proofs, and were willing to take more risk.

Concerns Around Balancing Household Chores & Crowd Work. Several women were concerned about the time commitments that

crowd work required. They shared how they had to spend significant time completing household chores and care work, such as cooking, laundry, cleaning, and tending to the elderly and children, leaving little time for anything else. Having no previous conception of crowd work, they compared it to other forms of work, such as teaching or their husband's profession, while questioning the rigidity these might entail. They described how inflexible schedules of such jobs made them unsustainable for women who are responsible for domestic work. For example, Hina, a housewife exclaimed, "*If I join such jobs, who will take care of my kids, who will cook? Everything will pile up. I cannot let that happen. It is not practical at all.*" Women participants wanted assurances that the crowd work could be done from home. Not only were they home bound because of their domestic responsibilities, some of them also expressed hesitation in seeking work opportunities outside in fear of harassment women routinely experience in public. Rachel narrated the difficulties she experienced earlier in commuting to work or getting groceries:

> *"If women are going out, we face problems. We can never be sure of what will happen. If we travel by bus or auto, many boys pass comments. One of my friends was harassed by guys on a bike a few months ago…It is a serious problem … We have become dependent on our brother or husband who have to go with us."*

To counter their apprehensions, both experienced workers and on-ground staff shared different anecdotes of existing women users to describe how they balance their work and household responsibilities. Experienced workers demonstrated the light-weight nature of crowd work and confirmed that the work could be done from anywhere and any time, including from the comfort of their homes. They emphasized that the platform is designed to be friendly to women and the tasks can be done in spare time without any overburden on their already hectic lives. Laveena, who was an experienced worker, described how crowd work was much less demanding than her domestic duties:

> *"People don't realize this but household work demands physical strength and is quite exhausting! I have to work in this constantly hot environment. If I'm doing the household chores, I feel tired … When my sister's daughter showed the work, I felt working on Karya is very easy in comparison. No physical strain, she was just sitting at one place and recording. It is nothing compared to housework!"*

Men on the other hand seldom worried about how crowd work would impact their home and work lives. They were curious to engage in crowd work mainly due to its novelty. For instance, Alok, who ran a dairy business, described that he was intrigued by the idea of working on the smartphone when his female cousin introduced Karya to him. Men saw this as an opportunity to work from anywhere, especially during breaks at work or when traveling.

Convincing Family Members. Several women participants (N=11) reported that regardless of male family members' conversations with on-ground staff, they had to do convincing themselves and take appropriate permission before beginning crowd work. They reported that their husbands and brothers were worried that using the app could lead to neglect in household chores. A few others described their family's concern of how such online work could expose them to "other men" and "unsafe spaces", leading to unnecessary trouble. Using the information gathered from the on-ground staff and experienced crowd workers, they shared exhaustive details around the type, place, and the medium of work, along with the amount of money they would be earning. They had to *"make them understand"* that there were no personal risks that could impact family reputation. Women participants found it easy to convince their family if one of the experienced crowd workers were their neighbors, friends, or relatives. When women anticipated pushback (N=13), some encouraged their husbands, brothers, or fathers to download the application and join the work as well. Bhim, Rita's husband, was one such participant who agreed to join to oversee her work:

> *"My wife shared that Karya was paying money for recording sentences. I was confused. Who pays money for recording sentences?…She said that it is a trustworthy company because her sister also completed work on it. How can I believe that just because her sister worked on it? Should we jump into a well just because her sister jumped, no? Right? …I called her sister and asked for all the details. I was still not convinced …My wife asked me to join with her. I also joined, just to keep an eye on her. "*

Successful buy-in from supporting actors who are part of women's immediate social networks make it significantly easier for women living in patriarchal communities to adopt technology in new endeavors [43]. In situations like that of Rita, flexibility to let their family members experience the platform increased their chances of getting approval to adopt and work on the platform. In more conservative homes, women were convinced that no matter what, their family members will not permit them to explore any kind of work opportunities. A fraction of such women participants (N=6) opted to join crowd work without the knowledge of their family members. We now outline the key reasons that motivated women to engage in crowd work.

Financial and Professional Aspirations. Women participants saw crowd work as a stepping stone towards fulfilling their financial and professional aspirations. All of them except five did not have a full-time job. Most of them relied on their husbands, brothers, or fathers for basic necessities, which sometimes led to bitterness and conflict. For instance, Hina, described how her husband "*challenged*" her to "*earn one Rupee*" and show that she can find work. Similarly, Rachel shared how she felt dependent on her husband saying, "*how many times can I ask? I always feel I am taking money from him.*" Even employed women had limited agency and financial autonomy; they were expected to give their earnings to male family members, who often decided how that money would be spent. Leelawati, a tailor, explained:

> *" I am a housewife in a joint family so I don't get money directly into my hands. The money is earned by my husband and my father-in-law. So if I need anything, I need to ask them…I joined tailoring to reduce that dependency, but I get very less money despite working all the time…My main motivation for working in this*

> *was earning some money for myself, which is really nice because then I don't have to ask them again and again."*

Women wanted to engage in crowd work mainly to prove their mettle, earn for themselves, and contribute to household income. They found crowd work a lucrative opportunity that allowed them to work within their constraints and earn money "*without having to do much work.*" Megha, a housewife compared completing a microtask activity to talking to people, saying "*we just have to speak out the sentences.*" Unlike women, most of the men were employed full-time and their concerns revolved around how to fit Karya into their "*hectic work schedules.*" Ironically, they compared their own schedules with those of women in their house to make this point. Kailash, an independent contractor, said, *"A housewife does not have much work. Cooking, washing vessels, and maybe taking care of kids. When they are bored, they can use Karya"*, suggesting that women get more free time at a stretch to do this kind of work.

On-ground staff also shared Karya's potential benefits in developing useful skills required for women in the outside world. Women participants foresaw these skills to be helpful in ultimately securing a full-time employment in future that is conducive to their schedule. For instance, Aisha, a graduate student, felt that she was looked down upon by her peers and teachers because of her dialect that was considered inferior compared to the ones spoken by women from more prominent communities. She assumed that speaking aloud sentences as part of Karya work would lead to improvements in her pronunciation, thereby reducing the microaggression she experience in her everyday life:

> *"The main thing is that pronunciation of many people who belong to my community isn't that good, even when we're talking in Odia. When we're talking to the teachers, some students speak very well. The teachers keep scolding us that the way you speak Odia and the way others do, there is a hell and heaven of difference. They say we can never speak like them [students from prominent communities]...Karya work gives me some confidence that I can learn the vocabulary, speak like others, and form a good impression on the teachers."*

They hoped that this newly found confidence would improve their self-worth and empower them to deal with social disparities and inequities.

Visibility. To provide familiarity and legitimacy to Karya work, on-ground staff proactively drew parallels between Karya work and technologies that were familiar to women. They shared how participants' recordings of Odia dialects would benefit other members of the community who are searching for Odia language on laptops and phones, similar to "*Google Translate*" and "*Google assistant*" apps on their phones. For example, Nandini, a student from Mayurbanj, assumed that her work was helping people learn topics, like agriculture and health, in Odia through *"computers using Google Translate."* Such explanations directly fed into women's aspirations of undertaking visible work that people in the community will acknowledge and appreciate. Many women (N=13) reported feeling motivated to improve the "*importance*" of their native language and making it accessible to a broader community in their own voice. Nishita, who ran a makeshift catering shop, described:

> *" He [on-ground staff] described how we have to record the sentences and they will put our voice in the computer. The computer will then pronounce our voice in Odia. I think if somebody from outside [the community] comes and they have a problem speaking Odia, they will get to understand the pronunciation with my voice. It will become easy for them [outsiders] to understand Odia. If everyone is hearing my voice and it is helping spread my language, what can be better than this? What can be a bigger motivation than this?"*

Having described the factors that impacted women's adoption of crowd work, we now outline their work practices and the challenges that emerged when they took up crowd work.

5.2 Crowd Work Practices and Challenges

A large number of male workers (N=8) completed their tasks while they were at work, traveling, or in public spaces, such as parks and markets. In contrast, *all* women workers performed their work inside their homes often in the company of other family members. This meant that not only did the family members' perceptions of Karya influenced and shaped women's work practices, but also the domestic setup affected the time and space in which they could work.

Family Criticisms & Deprioritization of Crowd Work. Many women reported being ridiculed and criticized by their family members for engaging in crowd work. For example, some of the sentences contained words from different rural dialects of Odia which many workers struggled to read aloud. Several women reported being mocked by family members who overheard the unusual pronunciation and made fun of their imperfect accents. On several occasions, fathers and brothers taunted unmarried women for their imperfect pronunciations, using phrases like "*women should know other dialects. Speaking inaccurately will lead to our family name being spoiled when you marry and go to your husband's house.*" Other family members also ridiculed the work practice of speaking aloud the sentences, devaluing the work women did. For instance, Bhagwati described how her husband constantly questioned the merits of the crowd work:

> *"When I started doing crowd work, no one in my house knew about it except my husband. My husband used to be around when I read aloud during afternoons and nights...He often teased me saying, 'The news broadcast is starting again.' When I got angry he used to ask, 'What benefit do you get anyways. What is the point of reading this?' It was a small thing, but I felt bad. "*

Many women felt that their family members valued their work efforts and contributions much differently than those of men. In addition to a lack of support from them, women also fielded criticisms around using the phone to do crowd work. Nalini, a graduate student, described how her family members always criticized her for being on the phone to do crowd work and the resulting impact on her household duties:

> *"My family members definitely had complaints around my work. They were saying things like how I'm leaving every other work and sitting down to do these recordings*

> *and that I am always glued to the phone. I told them this is how the work is done ... it did take significant effort to convince them. It was not just convincing them one time, but again and again. They were fine with me continuing Karya work only when I promised to not let the house responsibilities get affected."*

To avoid such complaints, women workers focused on completing their household responsibilities first and freeing themselves for a couple of hours in the night to do crowd work. However, if they anticipated household chores in the night, they tried to do some tasks , for example, when *"children were completing their homework"* or *"in-laws were getting an afternoon nap."* On rare occasions, when they had no time available to do crowd work, they delegated it to their children or siblings. When the housework became unmanageable, women either paused doing crowd work or stopped it entirely. Rachel shared:

> *"My cousin stopped working on Karya. She has a toddler. She thought she could manage. But, the pressure from her home increased and I can't go every time to help her."*

In a few extreme cases, younger women described how family members also questioned their integrity when they were found whispering into their phones to do the tasks. The family members' lack of understanding of the microtasks led them to believe that the women were hiding something and probably "*having affairs.*" Crowd work also resulted in more tensions when family members overheard women recording health sentences on taboo topics, for example, those related to reproductive health. Pavan, narrated how Aisha's brother upon hearing her record such sentences, took the phone away from her, and deleted the Karya application. He further elaborated:

> *" Men came to me and said that I am a bad person... It happened four times. The husband or the brother would come and shout at me, 'what kind of a man are you? How can you give such sentences to women and ask them to read?'... They made their family members drop out of the program. I tried to convince them that these sentences are useful for women. But people in the rural area are hesitant and scared to open up about the taboo topics."*

In contrast to women, men did not experience unwanted attention, criticisms, and accusations from their family members. They could do crowd work on their own terms. However, many of them undervalued crowd work in comparison to their full-time work because they perceived it to be a one-time gig. Arguably for the same reason, we also saw high number of men leave the job mid-way (52%) compared to women (36%).

Hiding Crowd Work. Because of the negative attitudes held by the family members on crowd work and the lack of support from them, many women partially or completely hid their engagement with crowd work from their families. To begin with, several women expected and were indeed, denied permission from their family to work on Karya. Many among them felt that trying to convince their family members otherwise was futile, and decided to hide their work life from their family. In many such cases, women participants' family members were completely unaware that they had taken up work. For instance, Megha described how her husband strictly prohibited her from taking up crowd work out of the fear that she might interact with unfamiliar men through Karya. Despite the restrictions, she joined the platform and completed the work:

> *"He did not like me working outside from the beginning, and even opening a WhatsApp account ... He tells me any man might take my photo, but I have secretly opened WhatsApp ... When he is sleeping in one room, I record very softly in the other room with the door shut ... I wait for him to leave the house and then do the work. ... I can't tell him that I'm working now. He will not accept. Maybe someday."*

Economic and social dependency on their abusive networks make it extremely difficult for women like Megha to work against such tightly controlled environments [35]. Many workers found it much easier to engage in small agentic activities that allowed them to work within the patriarchal structures, rather than question their current ecosystem. To reduce suspicion while working on Karya, women workers like Megha pretended to use their smartphones for other reasons, such as watching videos and speaking to a friend. Nalini described how her father and mother enforced strict rules to regulate her online activities, in fear that she might interact with boys. They only allowed smartphone access for educational activities during particular times of the day. When she realized that she was not going to get permission from her father to do crowd work, she told her parents that she would be recording sentences as part of an academic project.

A few participants who were living in staunchly patriarchal families hid the fact that they would be paid for doing crowd work. They felt that *"getting paid for doing professional work"* would lead their family members to assume that they are neglecting their domestic duties. A few women workers believed that their family members would force them to stop their work midway, if they come to know that they gave their bank account information to outsiders, due to family's fear of online fraud. Some women, who were doing crowd work outside the knowledge of their families, worried that money transfer to their bank account would raise suspicions, and in some cases, they were genuinely worried about being defrauded. To avoid that, they provided bank account details of their friends or acquaintances. Mukti, an on-ground staff recounted an incident:

> *"We had a few cases, they didn't want to reveal they are working at home. One girl was working in her friend's name, and she didn't tell her father. She was adamant to not give her account. So we asked her to give any family member's account. But, I remember she gave her friend's account as her family did not know about her work. "*

At times, the specifics of the crowd work motivated women to hide certain aspects of it. For example, several women workers reported doing crowd work when they were alone, specially for tasks that required them to read aloud sentences related to taboo topics. These sentences contained health information around periods, pregnancy, and sex. Women felt that saying such sentences out aloud could lead to unnecessary trouble at home. This hesitation was compounded by their own feeling of committing an "*immoral act*" by

recording such "*dirty*" sentences. Several women participants who felt comfortable recording these sentences either whispered slowly or increased their pace of recording to avoid drawing attention of their family members. In contrast to women, most men did crowd work without needing to hide their participation. Only three men hid information about Karya from their family and friends. One did so out of the worry that it might convey to others that he was not doing well financially. Two others heard about health sentences on taboo topics from other male users and decided to use Karya without the knowledge of their family to avoid any embarrassment.

Location & Time: Important Factors. Unlike men, several women reported having limited agency to decide where and when they could do crowd work. Majority of them lived in small houses with large families, making it difficult to find a quiet environment to record sentences with high accuracy. Participants complained how noisy environment at home was a major source of disturbance while doing crowd work. Mayawati, who had two children, described how she could not do tasks in the kitchen where she spent most of her time:

> *"There is so much disturbance in the kitchen. I have a joint family, so there is a constant influx of people and loud conversations. It is impossible to record sentences there. Akhila [on-sight staff] asked me to not do work in noisy places as it might impact my earnings. So I have to do my work in bedroom, nobody comes in and there is no disturbance"*

Many women had to use uncomfortable places, such as bathroom and terrace, to do crowd work to avoid commotion in their homes getting recorded (see figure 1.D). Often, they had to work very late in the night when everyone was asleep. For example, Leelawati had to hide her work from everyone except her husband because her in-laws were strongly opposed to her working anywhere. She described how she had no option but to do tasks late at night in the backyard or in the bedroom to avoid any suspicion. The usage logs corroborated that 79% of women workers were active around midnight (12:00 A.M.-03:00 A.M.). Unlike women, men had the freedom to do crowd work and could do it within and outside their homes, making it much easier for them to finish their tasks.

Relying on Support and Solidarity. Most women relied on their peers to cope with the challenges that emerged from engaging in crowd work. Several of them reported socializing with other women workers in their backyards or communal places to share their confusions and frustrations. Novice workers regularly reached out to more experienced workers to receive *instrumental* support in navigating crowd work [60]. Most common scenarios included receiving technological assistance to learn how to use the app. Bhagwati described how she navigated technological issues around recording sentences by taking the help of her friend:

> *"I didn't know how to download the Karya application and how to begin working on it, so I went over to her [friend's] place one day and she showed everything to me, like how to do the recordings. I didn't know about it and I was doing something wrong because when I used to record, my voice wasn't being recorded as I didn't press the button but the timer kept running, so I asked her about it and she explained everything to me."*

Several women also received instrumental support from on-ground staff when they had to pause or stop the crowd work because of their limited resources, like constrained access to smartphones and the Internet. For instance, Supryia shared how her children's online schools during the COVID-19 pandemic disrupted her entire schedule of doing crowd work because they needed the smartphones for their virtual classes. In several situations like this, on-ground staff helped by arranging the required resources for them. Examples included paying women through cash when they were reluctant to provide bank account details or paying for their Internet access. Pavan, an on-ground staff, described an incident:

> *"I motivated a girl to join crowd work, but what happens in rural areas is that they buy an old smartphone at a cheaper rate but they don't have money to buy voice or data pack … This woman did not have money to recharge the data pack to work. She used to ask her husband or in-laws. But because of a fight, she didn't want to do it. So she came and told me and then I added a data pack to her phone."*

We found that such instances of support took more time as they had to be approved and coordinated by the Readit management to ensure the safety of women participants. In additiona to instrumental support, women workers also sought *emotional* support to keep themselves motivated to continue the work [16]. They described how the emotional support from other workers proved vital in mitigating their concerns on delayed payments and discussing the challenges in managing their domestic responsibilities. Sameedha described how her friend helped her understand the value in recording health-related sentences on taboo topics:

> *"I was tensed and embarrassed recording those sentences. Later my friend said nothing is going to happen even if I read it. She had a conversation with me where she told me: 'all these issues are real, there is nothing wrong in reading them. Only when people read it they will feel less hesitant to talk about these things. There are several women who don't even know about these issues. We are helping them."*

Women workers also relied on phone calls and WhatsApp for seeking and providing *informational* support to each other [60]. Ambika, a housewife, described how she and her peers shared screenshots of difficult words from the app with each other through WhatsApp, asking for help in pronouncing those words. These methods of receiving quick and timely online support helped women submit more accurate recordings, thereby improving their earning potential. In fact, on a few occasions, experienced workers like Nandini provided tips to deliver higher quality work by telling her peers to *"put in more expression while recording to avoid their work being rejected."* Overall, these findings extend prior work in other forms of gig work, where workers overcame the minimal support available on the platforms by forming their own informal networks over other apps (e.g., WhatsApp, online forums) [39, 80]. While workers in these networks engaged primarily in instrumental and information support, participants in our study also showed evidence of emotional support.

In contrast to women, men performed most of the tasks individually and rarely relied on others to seek help. In a few instances where men sought support, they described instances of seeking out instrumental and informational support, instead of emotional support. Most men workers lacked the time to ask for help from others since they were already doing a full-time work and valued crowd work less than their regular occupation. For instance, Prabhu who ran a grocery shop in his community described how when he faced issues in pronouncing certain Odia phrases, he carefully thought from an economic perspective before seeking out help. He said: "*I take help sometime, but if I feel it will take long time, I don't do it, because at the end I am only earning one rupee per sentence. How much effort will you put for one rupee?*" Taken together, all the challenges we described so far resulted in women taking more time to finish the tasks than men. On an average, they took 28 days to complete all tasks and men took 26 days. However, despite the delays and the challenges, more women (64%) successfully finished all tasks assigned to them compared to men (48%), partly due to the support they received from other women workers and the on-ground staff.

5.3 Impact of Karya Work

We now outline the impact crowd work had on women's lives and the extent to which it realized their financial and professional aspirations.

Pathway to Agency & Autonomy. Our findings showed that despite the challenges faced by them, women crowd workers were far more effective in their work outcomes than men. Not only did they do more work and produce higher quality outputs compared to the men, they also, as a result, received more remuneration. An independent T-test showed significant differences in the earnings between women and men ($t(472) = -3.77, p < .001$). Results of the test showed that the earnings of women ($M = 2676.85, SD = 1309.83$) were higher than men ($M = 2178.76, SD = 1547.43$). Even though the total amount earned was not very large, the satisfaction of doing *"actual work"* made women feel accomplished. Moreover, there was an increase in their agency and many of them now had a say in how the money they earned should be spent. Some women kept the money aside for their own personal use or for "*unforeseen circumstances*" in the future, while some others gave the money to their husbands and other family members willingly, at times to emphasize their earning potential. Hina shared how the earnings from crowd work gave her a newfound sense of confidence:

> *"I wanted to show my husband, which is the reason I have kept it. He can see that even I can do a job while staying at home. If I get any other job, I will do it, and I will earn a lot of money."*

Women, who had to depend on their fathers, husbands, or brothers for basic material needs, used the earnings to meet these needs, and be a bit more independent, at least in the short-term. For instance, Supriya stated that she could now top-up her phone's data plan without having to ask her husband for money. A few others bought essential items for the house, such as furniture or small electronic items for their family members as a gift.

Several women appreciated how crowd work provided them a much needed break from the monotony of their domestic duties. They felt that they were accomplishing something useful and productive, which was different from their household responsibilities. Many women expressed their sincere appreciation towards the Karya platform, highlighting how they felt an increased self-worth, self-confidence, and agency resulting from their engagement with crowd work. These positive experiences and outcomes motivated several women to become active champions of the platform and urge women in their social circle to take up crowd work. Nandini shared how she motivated her friends to join the platform:

> *"Initially, I did not take this opportunity seriously. I started doing some tasks casually and once I got the first payment, I felt good and I finished all the tasks very soon. I then told my friends and remaining members in my circle . . . I told them to trust the app and just do it. . . I shared my own experiences when they had doubts."*

Many women shared how invaluable they found the solidarity from other women workers. The resulting emotional support kept them going as it was cathartic for them to discuss their work challenges, especially when they had to hide crowd work from family members. In some cases, crowd work also facilitated discussions among women on topics that are generally swept under the rug. Aisha described how she and her friend shared important issues related to women's health that no one talks about:

> *"My own experience, I have irregular periods for the last two to three years. People in the village when they hear about this they talk ill about me. . . Through those few sentences and discussion with my friend, I realized that it is not just me, many woman go through it."*

Eager for More Crowd Work: Future Vulnerabilities. The benefits that women accrued through crowd work motivated them to explore more such opportunities online. They frequently reached out on on-ground staff to show their enthusiasm for doing more work. Several women also searched for Karya like opportunities on Google, Facebook groups, Telegram groups, YouTube, and Instagram using keywords, such as "*data entry jobs in Odia*," "*work for women*," and "*work from home*." For instance, Nishita found YouTube videos on data entry jobs and Mayawati joined a Telegram group that sent out information on work from home jobs. Nalini showed us a message that she forwarded to a few of her peers:

> *Urgent hiring!! you can work from home! XXXX invites you to do online part-time work. The operation is simple, and you can withdraw at any time. You just need a mobile phone. click the WA link to receive 100 Rs and you can earn 2000-5000 Rs in 2 hours: https://wa.me/+91XXXXXXXx*

However, a lack of scaffolding around such opportunities made women skeptical. Unlike Karya, where an on-ground staff from their community provided contextual information, these jobs often rushed members into signing-up without addressing their concerns. Hina shared, "*How will I know whether they will give me work and whether the payment will be done?*" When a few women joined these opportunities, they felt disappointed not finding an ecosystem similar to Karya. Some of these opportunities were popular financial scams seeking to swindle participants. Three women who responded to such job advertisements experienced fraudulent behavior. Mayawati described how she joined a WhatsApp group that

promised remote work opportunities for women and was contacted by a group member who promised to pay her an advance salary of INR 5,000 through Paytm[2]. The group member sent Mayawati a payment to *receive* link, disguised as a *send* link, a popular social engineering tactic used on digital payment apps [54, page 10]. When she clicked on the link, it transferred the money from her account to the fraudster. Women also experienced online harassment when exploring crowd work opportunities online. Bhagwati described her sister's experience:

> *"There was a Facebook group for online jobs. When my sister joined the group, she started getting many messages asking her bank details and password. We all were scared because we did not know why that person was asking all those details. When my sister said no to him, he started abusing her. I told her to leave the group immediately and block that person. From that day onward we got cautious and decided not to entertain remote work opportunities online. "*

Toll on Wellbeing. It was also evident from the women's accounts that their enthusiasm to work on Karya coupled with their need to prioritize their household chores affected their physical and mental health. As mentioned earlier, many women were left with no choice but to do crowd work during the night hours when everyone was asleep. Some of them shared how they compromised their sleep time to an average of less than five hours per night in order to do crowd work. Ambika explained her situation which was strikingly similar to the experiences of other women:

> *"I spent sleepless nights while doing this work. If my daughter is awake, she will take away the phone. I don't get to use my phone when she is playing games or watching videos . . . If I take away the phone, she will not let me do housework. So, I let her have the phone. The only time left is when she sleeps at night. I can only work then."*

Women, who had to hide their work from family members, shared how *"being exposed"* was a constant source of stress and anxiety. This meant that they had to worry about additional work-related planning around the platform, such as when and where to work, what and how to record, in order to avoid being discovered. The overhead in planning and execution was distressful for many [87]. For instance Megha's husband was watchful of her online presence and controlled her smartphone usage. His vigilance pushed Megha to be careful of how she did crowd work around him:

> *"It is just easier to plan my work without telling him. . . I am concerned that he will take away my phone, if he comes to know. He has already broken two of my phones because I used WhatsApp. What if he throws this one too? I will not be able to work then and cannot afford another phone. I have to be super careful around him. "*

On the whole, our analysis found that women's engagement with crowd work realized many of their unmet needs, providing them more agency, confidence, solidarity, and financial autonomy. Women saw crowd work as a stepping stone to fulfilling their personal and professional aspirations. However, these positive outcomes came at a cost on their physical and emotional wellbeing, and also encouraged some women to seek remote work opportunities online that exposed them to harassment and fraud.

[2]A popular digital payment app

6 DISCUSSION

Women in low-income communities are often embedded in environments with deep rooted patriarchal norms where adoption and use of technologies by women often result in clashes, tensions, and conflicts. Sultana et al. [85] call on HCI researchers to design technologies that minimize clashes, by empowering women *within*, rather than *against*, a patriarchal society and supporting women's existing practices to prevailing domestic constraints. We respond to this call by first describing the tensions that occurred when values extended by the crowd work platform were *against* the patriarchal norms. We then provide design recommendations that foster practices that empower women working *within* the patriarchal norms. In doing so, we leverage the valuable work of Sultana et al. [85] to discuss ways to increase work opportunities for low-income women in deeply patriarchal societies.

6.1 Clashes & Tensions in Crowd Work

Bardzell [12] argue that technology interventions don't exist in vacuum and have a bi-directional relationship with the ecology in which they are deployed. We saw how clashes and tensions erupted when women's aspirations and commitments to engage in crowd work were at odds with what their families expected them to do. For brevity, we describe two key tensions that women had to navigate as they engaged in crowd work in the hopes of realizing their personal and professional aspirations.

Visible Self, Invisible Work. While crowd work created opportunities for women workers to gain visibility, it was at the expense of their work being invisible. Star and Strauss [84] in their seminal work described how labor's visibility depended on two dimensions: (1) the worker and the (b) work itself. Impact of visibility on either dimension contributes to added pressure, stress, and negative professional wellbeing [84]. In our study, women crowd workers became more visible as they gained a sense of financial autonomy when they were able to earn without having to step out of their homes. They could now decide for themselves how to spend their earnings. Some women were able to buy necessities for themselves and their homes, and others felt a sense of pride in contributing towards their family income. These actions gave women more visibility in their personal lives and improved their self-worth. At the same time, the fear of being stopped from taking up this new type of work, compelled some women to hide the work that provided them the visibility, resulting in a constant worry to disguise their work. The constant worry to disguise their work and plan when and where to work to avoid being discovered. Even when women did not need to hide the work, they were expected to, and had to, prioritize domestic duties before crowd work, resulting in stress and burnout. These negative effects were at odds with the feeling of increased autonomy that they gained from the same work.

Through crowd work, women improved their skills and capabilities, created support networks around them, explored other work opportunities, which all led to them becoming more visible

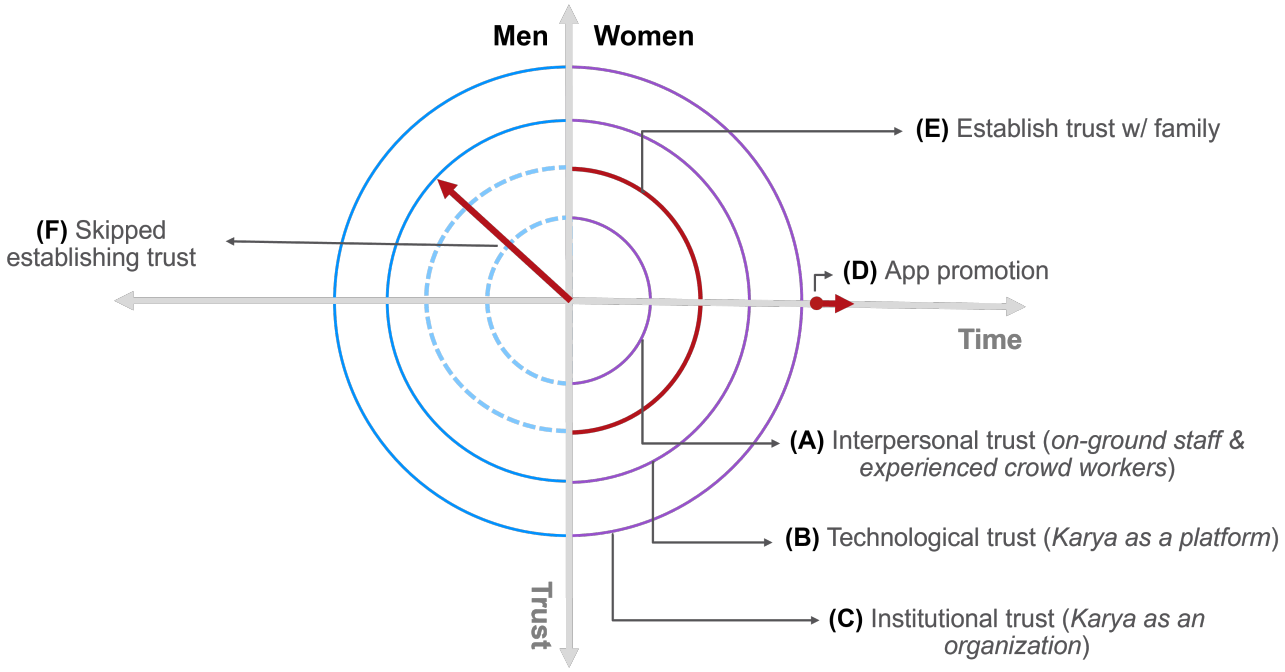

Figure 2: (A) The inner most circle is *Interpersonal* trust that women develop with on-ground staff & experienced crowd workers; (B) Women develop *technology* trust when their earnings are reflected in the app; (C) Women start trusting Karya as an *organization* ; (D) Institutional trust motivates women to promote Karya to other women; (E) Women had the need to establish trust with their family members; (F) Men could afford to skip inner circles of trust.

outside of their homes and in their societies. Yet, the crowd work which resulted in these effects remained invisible at the society level, contrary to women's expectations of direct and visible societal contributions. Unlike traditional forms of work, such as teaching and manual labor, where the contributions of the work are visible and recognized, the outputs of the crowd work were invisible, de-identified, and devalued in sharp contrast to women's hopes of their voice being visible and known to millions of people like them.

Sociocultural Conflicts. Another set of tensions arose when the tasks that enabled women to earn were also the ones that directly clashed with the prevalent patriarchal norms. Take the case of the health-related excerpts that contained topics like menstruation and sex. While a few women found it liberating to record sentences related to women health issues, many were embarrassed and ashamed since these topics were considered taboo and were not discussed at all in their families. In instances, when women went "*against*" the societal norms and recorded such sentences to earn money, it led to verbal clashes with male family members and their access to smartphones being revoked, severely disrupting other benefits they received from their smartphone use.

As crowd work becomes more popular with low-income communities in the Global South, it is likely that women would be subjected to more harm, especially if they are forced to do work that conflicts with the societal norms and their own values. We already know how crowd workers engage in work that takes toll on their wellbeing [8, 19, 37], but these risks and harms are more pronounced for low-income women who operate in settings where domestic violence and everyday oppression is their lived reality.

6.2 Reimagining Crowd Work for Low-Income Communities

Having described the key clashes and tensions that emerge as low-income women start to engage with crowd work, we now discuss *what* can be done to mitigate these tensions and integrate crowd work practices with women's current societal structures to empower them from *within*. This means re-designing elements that are at odds with the prevalent patriarchal norms, and strengthening support networks and situated tactics.

Fostering High-Trust Networks. First of the many bottom-up sociotechnical practices that women developed was leveraging trust to take up crowd work and see it through to completion. To gain a deeper insight into the role of trust, we borrow Fukuyama's notion of trust [33], which shows that trust is an ongoing process in work settings that is developed in increments over a period of time (see Figure 2). Fukuyama visualized trust as a series of concentric circle where the smallest circle maps to interpersonal trust among individuals and the largest maps to social trust. In our study, interpersonal trust (Fig. 2.A) played a key role when women relied on other women workers and on-ground staff from their own community to allay their concerns about crowd work, which

ultimately led them to give it a try. Fukuyama notes that as the circle becomes broader, trust translates from individuals to a more generic form. We observed this shift when women started seeing their work being validated and earnings reflected on their app.

At this point, the women workers developed trust on the app, namely *technological* trust (Fig. 2.B). Finally, when the women were assured of consistent payment through timely deposits in their bank, their technological trust on Karya as an app translated to Karya as an organization, namely *institutional* trust. (Fig. 2.C). Fukuyama describes how this transition from specific circles to more generic ones is critical in developing "high-trust networks", enabling workers to establish a positive bi-directional relationship with the organization and reciprocate the benefits they receive. Women in our study did this by advocating for the organization and promoting their app to new women and thereby, propagating a new radius of trust (Fig. 2.D).

We extend Fukuyama's trust framework to show how gender impacts the formation of high-trust networks. Lacking agency and autonomy resulting from patriarchal norms, women had to go through an added layer of trust building to convince their male family members that crowd work is reliable, safe, and appropriate (Fig. 2.E). Even when they trusted crowd work, they moved back and forth between layers. For example, when payments were delayed or less than expected, they lost trust in the app (technological trust) and Karya (institutional trust) and had to rely on staff and peers (interpersonal trust) to reestablish the trust before moving forward. In contrast, men could skip some of the layers as they were less risk-averse, and did not need anyone's *permission* to engage in crowd work (Fig 2.F).

Our findings emphasize Fukuyama's observation that high-trust networks are essential not only to reduce attrition rates, but also to increase the overall quality of work. We now outline how can we build high-trust networks that provide support and solidarity to low-income women who are engaged in crowd work to meet their financial and professional aspirations.

Community-Driven Adoption and Sustenance. One way to improve the quality of trust networks is to strengthen community-driven structures and relationships that women currently rely on for varying levels of help and agency. Taking inspiration from HCI4D research and practice salubrious of the role intermediaries play in improving information access and agency in low-income communities, we propose two ways of establishing high-trust networks: (1) by developing *community agent* model and (2) by organizing *self-help groups (SHGs)*.

In community-agent model, members from the community assume the role of an agent to assist and empower community members. Take the case of the community health program in India that relies on the work of over a million paraprofessional community health workers (CHWs) to provide last mile health services in hard-to-reach rural and urban communities [11, 78]. CHWs are women, who are recruited from local communities, receive basic medical training, and then provide essential services to their community [79]. The success of community health programs in India, and similar implementation in other critical domains like agriculture and finance [61, 71], suggests that a similar system could be adopted to provide support and solidarity to low-income women crowd workers. In a re-imagined crowd work platform, experienced women workers can be hired to recruit and support women in their communities who are interested in remote and flexible work opportunities. Being from the same community and having lived experiences of strong patriarchal systems, experienced women workers would have a much deeper appreciation of the challenges women encounter in doing new forms of work. Consequently, they can provide appropriate scaffolding and positive reinforcement when needed. Our recommendation builds on the previous research in Western settings that has explored the idea of leveraging the feedback of experienced workers to improve the quality of crowd work [38, 58, 70]. In particular, several of these prior studies have taken a platform-centric approach, primarily focusing on efficient payouts for workers through a peer-review system. For instance, recently Nguyen et al. [70] have shown how positive peer feedback has the potential to improve overall work quality of crowd workers. In our proposed model, worker's increased productivity due to such peer support can be leveraged by platforms to further incentivize those workers who took out time to provide peer support. Our model also builds on the nascent work of Gray and Suri [38], Gray et al. [39] who have explored how peer networks in crowd work setting can improve overall experience and occupational wellbeing in addition to workers' productivity.

Needless to say, such new forms of institutionalized support in the context of crowd work needs a thorough examination before any large-scale implementation. To begin with, more research is required to assess how such structures could perpetuate class-based or caste-based inequities and how monetary incentives impact the quality of support and power dynamics between agents and women.

Another model we propose is community-driven, small-scale *self-help groups* that have shown demonstrable impact on women's economic empowerment by improving their access to microfinance opportunities [86]. A re-imagined crowd work platform could connect women workers to other willing women workers in their vicinity to provide support and encouragement to each other. It could take the form of hyperlocal leaderboards, in-person small group meetups, and online peer support groups where women can assist and support each other. Prior research with marginalized populations have shown great promise in building community fostered work environments that are bolstered by regular offline meetings, collective work-based activities, and informal conversations. In particular, Hui et al. [46] have demonstrated how developing relationships in offline spaces within work environments can often boost self-efficacy and motivation for inexperienced technology users to adopt technology for work. In our study, we saw evidence of some of these offline activities already happening, albeit informally. A re-imagined platform could play a key role in shifting the power dynamics towards women. In line with TurkOpticon [50], the platform could empower women to engage in collective deliberations and collaborations to identify tasks that are at odds with the prevalent societal norms and their own values.

Designing for Visibility and Empowerment. Deci et al. [23] higlights the role extrinsic and intrinsic motivations play in improving workers' autonomy and competence. Extrinsic motivation comes from the visibility and recognition of the worker and their

work by other members of the community. However, in strong patriarchal systems like ours, increasing the visibility of work can expose women to more harm and vulnerabilities. Instead, we suggest designing to improve workers' intrinsic motivation and empowering them to sustain the work while working *within* the community structures. One way it can be done is by increasing the visibility of those aspects of work that were previously hidden. For example, many women reported that they never received any validation or feedback from the requester on how they could improve their performance. A lack of such interaction impacted their enthusiasm and women felt demotivated when their earnings were deducted but they were given no feedback. A re-imagined crowd work platform could improve worker's visibility into how their work will be evaluated and what will be the success metrics. The platform could also provide positive reinforcement in the form of tags, such as "excellent clarity" and "impactful voice", through either a manual or automated quality validation. Such positive and visible attestation of their work can go a long way towards improving workers' motivation and enthusiasm.

Many women joined crowd work in the hopes of making a mark on the world, but were clueless on how exactly their contributions will be used. A growing body of scholarship in HCI talks about the importance of making the contributions of crowd work visible [34, 38, 89]. A re-imagined platform would allow women to learn how their work contributions will be used in order to make them feel more valued than a random data point. A way to achieve this is by highlighting the parts of workflow that show how the worker's data contribute to the final product.

Finally, many women learned new skills (e.g., improved pronunciation) by engaging in crowd work and saw it as a stepping stone to professional work. However, such aspirations remain unmet, not just for women workers on Karya, but also for crowd workers on other microtasking platforms. The potential of crowd work-based education is enormous. A re-imagined crowd work platform would enable women to engage in a diversity of tasks, including peer tutoring and mentoring, and provide them coaching on the skills that are necessary to complete a range of tasks successfully.

6.3 Minimizing Harm

Our work is situated in complex settings where women's agency and rights are routinely undermined. In an environment charged with deep-rooted patriarchal norms, crowd work exposed women to different harms and vulnerabilities, but it also inched them a step closer towards agency and autonomy. So, how should technologists and designers approach design interventions and technology deployments, particularly when they aim to empower women and dismantle patriarchy? First and foremost, it is important to recognize that the sheer weight of the inequality low-income women experience in everyday lives could rarely be addressed by a single design or technology intervention. Sadly, the advances in technology are often seen as the silver bullet solutions for complex societal problems. The United Nations (UN) has advocated using technology to promote women empowerment and UN Women has prioritized innovation technology as one of the drivers of change [63]. Technology, in and of itself, cannot bring social change [90]. In fact, without appropriate scaffolding and supporting structures, an ICT intervention, at best, could lead to unmet aspirations and, at worst, result in direct harm to the very communities it aims to serve. Our findings demonstrated how the lack of support structures led women to be exposed to more harm and vulnerabilities when they engaged in crowd work in the hopes of financial and professional gains.

HCI researchers and practitioners interested in designing for low-income women in deeply patriarchal societies need to embed themselves in the communities where women work and engage in value-sensitive design and participatory design to deeply understand the constraints under which women currently operate. As Sultana et al. [85] suggest, they need to design *within* the patriarchal system, even if ultimately they wish to subvert it. This means engaging not just with women, but with their husbands, brothers, and in-laws. Not only designing an isolated intervention, but deeply interweaving it into the existing practices (e.g., self help groups, women-only meetups) and support structure (e.g., local grassroots organizations). And, finally, not only deploying a one-off opportunity towards economic empowerment, but long-term, sustained efforts that routinely shape in response to emerging clashes and tensions. For example, we found that many women wanted to do more work, having on balance, derived benefits from it, but couldn't because Readit had sufficient data collected in Odia language. While one-off, iterative deployments of technologies are necessary for research and product development, they have the potential to set unrealistic user expectations. The researchers and practitioners must plan for and set the expectations early on, even before engaging users in any kind of design and deployment activities.

Finally, HCI researchers and practitioners must proactively assess and address the harms that design and technology could bring to women, instead of reacting to it with bandaid solutions. Our interviews found that on-ground staff set unrealistic expectations on how crowd work would lead to economic empowerment and increased agency, without discussing the tensions and clashes it could lead to. Even when women experienced and shared challenges, rarely were they asked to scale back on crowd work and instead were encouraged to continue doing work. At the very least, women should be informed of expected risks and harms, and should be given opportunities to minimize those risks, even if it means that they have to stop using the technology that is designed to "empower" them. Additionally, periodic check-ins with women users who are new to technology are needed to keep emerging challenges in check. Overall, these measures will not only safeguard women's interests in the long-term but will also help them move forward constructively towards agency and autonomy in a complex patriarchal environment.

6.4 Conclusion

With the proliferation of crowd work in recent years, low-income women are increasingly taking up such work with overall positive expectations. Our study, puts these expectations in check as we show major challenges with crowd work. Several features of crowd work often require women to develop practices that are in direct conflict with their family's patriarchal norms. Such conflicts created several tensions and impacted women's overall wellbeing. To

address this inequity, we propose a set of concrete design guidelines for platforms, researchers, and practitioners alike to make crowd work more inclusive to women in their prevailing domestic environment.

We acknowledge that our findings are primarily limited to a single state in India. Our objective was to provide an in-depth study of women's experiences in the Global South. While this approach provides a deeper engagement with our participants, it limits the generalizability of our results [83]. Second, the study took place remotely due to the pandemic, limiting our ability to capture the broader perspectives of the family members of the women participants. In future, we plan to engage with family members of women participants working on diverse crowd work platforms to provide more comprehensive perspectives. Thirdly, while Readit personnel were present in the interviews to provide a safe and welcoming environment for women participants, we acknowledge that their presence could have potentially deterred some of the participants from speaking more critically about their experiences with Karya. We plan to conduct more in-depth ethnographic research and longitudinal engagement with the women workers to mitigate such issues.

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