The Promise of the Sharing Economy among Disadvantaged Communities

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ABSTRACT
The digital-sharing economy presents opportunities for individuals to find temporary employment, generate extra income, increase reciprocity, enhance social interaction, and access resources not otherwise attainable. Although the sharing economy is profitable, little is known about its use among the unemployed or those struggling financially. This paper describes the results of a participatory-design based workshop to investigate the perception and feasibility of finding temporary employment and sharing spare resources using sharing-economy applications. Specifically, this study included 20 individuals seeking employment in a U.S. city suffering economic decline. We identify success factors of the digital-sharing economy to these populations, identify shortcomings and propose mitigation strategies based on prior research related to trust, social capital and theories of collective efficacy. Finally, we contribute new principles that may foster collaborative consumption within this population and identify new concepts for practical employment applications among these populations.

Author Keywords
Sustainability; sharing economy; marginalized populations; unemployment; Lyft; TaskRabbit; Airbnb; NeighborGoods

ACM Classification Keywords
H.5.m. Information interfaces and presentation: Misc.

INTRODUCTION

The sharing economy, also referred to as the peer-to-peer economy [3] and the collaborative economy [3], involves the sharing of physical assets and services among people. Websites and applications such as Craigslist, Airbnb, and Lyft are platforms that support a sharing economy in which individuals can both buy and share items or services. Technological systems and platforms, or marketplaces exist to support the exchange of physical assets and services in the sharing economy; those buying and renting from the sharing economy are referred to as consumers, and those individuals that sell or provide these services are known as (micro)entrepreneurs [31]. In this system, consumers and (micro)entrepreneurs alike are referred to as peers. Peers are often connected with social networks and rely on cooperation and trust for successful exchanges [3]. According to Leadbeater, the 20th century was one of "hyper-consumption" in which credit and what a person owned defined the individual; in the 21st century, however, reputation, community, how we share and what we access will define us [22].

Though the concept of a shared commons has been around for centuries, the notion of a digital-sharing economy, or collaborative consumption is more recent and is grounded in online social network technologies and the behaviors found in these technologies [3]. People are now sharing assets to supplement their income and using others' assets to save money. Other benefits include establishing and strengthening connections while sharing, which could build community.

Past research states the importance of networking and having the right connections to find employment [18]. However, in lower-income areas, individuals are often disconnected from outside communities [5] and even experience distrust within their own communities [7]. Considering these disconnections, lack of trust, unemployment, and low-income factors, Dillahunt [7] asks, *How do people foster connections for employment in economically distressed areas,* and in areas where connections are limited. She speculates that sharing-economy platforms could provide opportunities for those with little to no job history to build reputations and link to external networks. Bradley poses a related question in an interview described in [23]: *How can we take these sharing mechanisms and torque or repurpose them from the point of view of people for whom sharing is not a cool, optional, sexy, 'I-don't-want-to-be-burdened' thing, but for people for whom it's an absolute necessity because they don't have the resources for traditional ownership*? In this article, we refer to these individuals as marginalized, or individuals who are unemployed, underemployed, and living in areas of economic decline. This research asks whether the sharing economy is feasible among these populations, why or why

CHI 2015, April 18 - 23 2015, Seoul, Republic of Korea

ACM 978-1-4503-3145-6/15/04$15.00
http://dx.doi.org/10.1145/2702123.2702189

not, and makes the following contributions to the HCI literature:

- Identifies success factors of the digital-sharing economy for individuals that are un(der)employed, financially constrained, or from disadvantaged neighborhoods;
- Identifies shortcomings of the sharing economy among marginalized populations and suggests mitigation strategies for these shortcomings;
- Provides design concepts for practical employment applications for marginalized populations and technologies to foster social capital.

RELATED WORK

Four principles of the sharing economy

Sharing economy platforms allow people within and across communities to connect with individuals to provide and benefit from basic skills and services such as babysitting and housecleaning, or physical resources such as housing and transportation. Botsman and Rogers contribute a set of guidelines for the sharing economy to succeed [3]. According to these authors, the four principles of collaborative consumption include: 1) trust between strangers, 2) idling capacity, 3) critical mass, and 4) belief in the commons. Each principle is weighted evenly, but some may be more critical than others depending on what is being shared and who is participating in the sharing. Many applications of the sharing economy require some trust between strangers to work. For example, sharing your home requires some level of trust that the consumer, in this case the tenant, will not destroy it. Whereas in the past, these types of exchanges were handled by a third-party, socio-technical platforms now exist to support these interactions. For example, features such as ranking and ratings allow stakeholders to provide feedback so that others can decide whether to engage in sharing or trading.

The unused potential of a resource, such as the empty seats when you drive a vehicle alone, is known as idling capacity [29]. Individuals having resources with idling capacity during some time period and being able to maximize the utility of these idle resources is what helps the sharing economy function. Critical mass ensures that customers within the sharing economy feel that enough choices exist for them to feel satisfied. In addition, critical mass is needed for 'social proof,' or social influence so that there is conformity and social acceptance among others. The last principle of the sharing economy is belief in the commons. In essence, participating in these platforms, both by sharing or consuming, supports the system and adds value to the community as a whole. Recognizing this is essential for the sharing economy to operate [3].

These four principles served as a framework to address our research questions for those in our target population. Past research identified issues such as discrimination with the sharing economy, despite these principles being in place [9]. Our more recent objective was to evaluate and strengthen these principles for broader populations.

Known problems of the sharing economy

Digital applications of the sharing economy are still relatively new, and popular press and social media have covered them extensively. Though much of the coverage around consumers of the sharing economy has been relatively positive, newer articles describing the experience of service providers, or (micro)entrepreneurs, have been less positive. For example, consumers, or workers of TaskRabbit, referred to as "rabbits," have reported unfavorable working conditions and underpayment when performing tasks for others [30]. Another study suggested that social platforms like Airbnb make it easier to racially discriminate online because it requires hosts to provide photos [9]. In addition, questions around worker concerns [16], legal liability, insurance, and other regulations pose challenges to the system [14]. Addressing these issues will require innovations and change in the fields of economics and public policy [1] and information technology. Despite news coverage, few formal publications identify sharing economy success factors for populations that primarily consist of individuals who are un(der)employed, financially constrained, or from disadvantaged neighborhoods. This article attempts to do so.

Future challenges and opportunities

Because of the economic crisis, unemployment rates have risen; the purchasing power of consumers has declined; and bank loans have become more difficult to obtain [6]. Such factors have resulted in individuals looking to both earn and save money. Sharing is a common method in which individuals, particularly among low-income groups, have saved money. For example, close-knit, low-income individuals often share expenses and transportation. They also provide social and emotional support and barter services such as childcare [8].

Though sharing was prevalent among low-income groups before the digital age, there have been concerns about increasing levels of mistrust in disadvantaged neighborhoods and a general decline in social capital [8]. Given the potential for increased social capital, income, reciprocity [17], and the increasing access to ICTs in disadvantaged communities [6], the digital-sharing economy could greatly benefit these communities.

The emergence of digital platforms such as Amazon Mechanical Turk (AMT) has seen an uptake among low-income groups in India; however, workers in developing countries are not yet completing tasks for a living [27]. Past research investigating employment technologies (e.g., ODesk, Craigslist, LinkedIn) for individuals with varying socioeconomic and criminal backgrounds suggest that factors such as the lack of credit, the need for money upfront, and reluctance to provide personal and credit card information online may prevent individuals from using such

Figure 1: Workshop "Learning Activity" – group report out

technologies [17]. Further, the need for an established reputation could be restrictive due to limited social capital among these groups [7,17]. Our research extends this work by evaluating the validity of these findings among a disadvantaged population.

METHOD

Inspired by participatory design techniques [2,10,13], we conducted a three-step design activity. Our process consisted of two workshop sessions in a publicly accessible university center in a midwestern U.S. city known for its economic decline. We recruited 20 participants who had been actively seeking employment for the past six months by advertising in local unemployment offices, on Craigslist, and in barbershops and hair salons. We also relied on word of mouth to disseminate the information. We leveraged cultural probes [13], user profiles, role play [10], and scenarios [2], to help characterize four popular sharing economy applications. Group goals were to explore, evaluate, discuss, and provide researchers with feedback regarding the feasibility of the applications for each group member and for their specific neighborhoods and communities. Our material's Flesch-Kincaid score ranged from the 4.9-6.7-grade level to ensure overall reader accessibility and comprehension.

Step 1: Survey

At the beginning of each session, we gave participants a 15-minute survey. We sought to understand employment status, length of unemployment, employment barriers (e.g., lack of resources such as transportation or childcare), existing skillsets, an assessment of which sharing economy applications they were aware of, and strategies for employment (e.g., education, networking). We wanted to further understand how participants leveraged their social networks for employment, their trust in their community, and how important social networking was in their approach to finding employment. Finally, we collected basic demographic data such as age, education level, and income.

Step 2: Learning activity

The workshop consisted of activities designed to evaluate the principles of collaborative consumption among participants from our target population. A key focus of the workshop was improving employment, so the workshop session was designed to allow participants to express their needs in terms of obtaining employment. The workshops began with a meet and greet, followed by a presentation of general ground rules for the workshop. The agenda included a one-hour "Learning Activity" followed by a 10-minute session for groups to share their results with the other groups. We primed participants to report on the following: their assigned sharing-economy application and a description, their impressions on whether it would work in their community and why, and whether group members would personally use the application for employment.

Participants formed groups based on their seating arrangements. The application each group analyzed was randomly assigned.

Workshop packages: We created workshop packages for each sharing economy application evaluated: NeighborGoods, Lyft, Airbnb, and TaskRabbit. These applications were chosen for two key reasons. First, the first three applications were already available to participants; TaskRabbit was advertised to be forthcoming. Second, we chose to represent diverse areas of the sharing economy (e.g., physical goods in NeighborGoods, cars in Lyft, space in Airbnb, and services in TaskRabbit). Each workshop package included application and user response packets.

Application packets: The application packets consisted of short application descriptions, user profiles based on prior research [17], and a concrete scenario describing how the application was used. Each scenario featured one or more of the user profiles using the application.

User response packets: The user packet consisted of a set of 20-25 questions addressing the four principles of the sharing economy [3]. We separated questions into three sections and tailored questions for each application. The first section, designed to capture participants' personal thoughts on the application, included a set of preliminary questions for participants to address only after learning about their respective application. As an example, questions about NeighborGoods included: *Would you use this application? What types of items would you share? What types of items would you borrow*? The second section consisted of discussion questions for each group. This section was to be completed only after individual participants completed their individual questions. The goal of this section was to help frame group discussion. Examples include: *Do you think NeighborGoods would work for your community? Do you think you could save money using it? Do you think the profile characters would benefit from it? Why or why not?* The third and final response section was designed to help us capture participant reflections and impressions based on their group discussions. Sample questions included: *Did people in your group believe that NeighborGoods could work in their community? Why or why not?*

Figure 2 – Sample application packet including a product description (left) and user scenario with user profile (right)

Following methods of participatory design (PD), we leveraged role cards to ensure all members of each group contributed to the discussion. Role titles were selected to empower individuals to feel a part of a group and to increase participation. Roles included: project manager, product evaluator, and client (there were two clients at most and one client at least per group). Role cards included participant responsibilities. For example, product evaluators were responsible for throwing "wrenches" and checking if the four principles would uphold in their communities. In the case of NeighborGoods, evaluators determined whether group members had specific items that they could share (e.g., idling capacity). Project manager responsibilities included ensuring that all response sheets were completed among group members and all questions were addressed. Clients asked their team members whether they would use the application and discussed whether the provided user scenarios were realistic. Group members shared their roles at the beginning of the session.

After the "Learning Activity," each group delivered a summary of its application and shared thoughts about the feasibility of the application. This allowed for feedback and questions from the larger group. Each group used digital recorders to capture discussions.

Step 3: Designing Activity

After a 10-minute break, groups participated in a Designing Activity to answer the following question: *If you could talk to the developers of Airbnb, NeighborGoods, Lyft, and TaskRabbit, what would you tell them to design/build/create for you based on your current employment situation?* They were then prompted to: *Think about how you currently look for employment and how to improve the process*. Participants were encouraged to either improve upon the existing applications or generate ideas for entirely new applications. We gave participants 30 minutes to complete this task. Upon completion, a group member, or group members, presented their application and discussed results.

Participants had access to pens, pencils, paper and drawing pads, 3"x5" sticky notes and 25"x30" self-stick easel pads, markers and color pencils. We compensated participants $30 for attending the workshop, provided food, and gave them an information sheet with descriptions of other sharing-economy applications available. Three workshop facilitators were available to answer questions as needed, and documented their observations. All session recordings were professionally transcribed.

DATA ANALYSIS

We collected the following raw data: surveys, response sheets, facilitator observations and summaries, participant notes, and transcriptions of the learning and designing sessions. Due to the small sample size, we were unable to conduct statistical analysis on the survey and response sheet data. Nevertheless, we performed descriptive analysis of survey data by summarizing demographic information, employment status, and by identifying trends regarding prior knowledge and use of employment and sharing-economy applications. We analyzed our response sheets in a similar manner; however, this analysis was driven by our research questions.

We engaged in qualitative analysis of our transcriptions, as the use of technology to support the digital-sharing economy is relatively new and more so among disadvantaged communities. While past work [7, 17] and underlying principles of the sharing economy [3] helped us form initial codes (e.g., aspects of social capital such as bonding and bridging ties, trust and distrust, and employment barriers), we also allowed codes to emerge from the data in a more inductive fashion. We relied on intensive group discussion to apply codes to transcripts and to resolve group discrepancies [21, p. 243].

In our analysis, we sought to understand the concerns or barriers to the success of these applications, noted commonalities in user responses, and generated new categories and themes as they surfaced. We iterated over the data until we could no longer identify new sub-categories. As the results will show, these analyses led to new criteria for the success of these applications among our target population.

RESULTS

We recruited 20 participants across both sessions, which equated to six total groups. Four groups of three (N=12) were in our first session, and two groups of four (N=8) were in the second session. Therefore, our second-session groups had to select from two unmarked packages, which were NeighborGoods and TaskRabbit. Overall, participants appeared to take on their roles and convey team-member engagement. We observed team members holding each other accountable to their roles, which appeared to encourage active participation among all group members. We collected all participant-response sheets and recorded approximately 7 hours of data.

This section includes results from our surveys, response sheets, and transcripts from our Learning and Design Activities. Our survey data allow us to describe participants' employment status, perceived barriers to employment, current knowledge of sharing economy applications, and strategies for employment. Data from the

response sheets and Learning Activity transcripts allow us to address our research question regarding the feasibility of these applications among our population. Qualitative data from the Design Activity transcripts were analyzed to determine participants' suggestions regarding how technology could be designed to help them improve their employment situation.

Sharing economy prior knowledge and engagement

Of the 20 participants, 19 fully completed their surveys. Eighteen of the participants identified as African American and ranged in age from 20 – 70 (M=40, SD=12.81). Seventeen participants held an associate's degree or less and earned yearly incomes of $20,000 or less. Eighteen participants had a high school education and above, so the majority of participants had at least a 6th grade reading level. While all participants were seeking employment, slightly more than half (N=13) of our participants were also unemployed. Four participants classified themselves as being employed, one of whom indicated that they were self-employed, and another of whom indicated that they were a student. All participants were open to seeking jobs in retail/distribution (N=20) and eleven participants were also seeking manufacturing jobs.

Our survey indicated that participants knew about newer applications of the sharing economy (e.g., Uber, N=5; Lyft, N=4; Amazon Mechanical Turk, N=5) and two had used them (Lyft, N=1; AMT, N=2). The most popular application that participants had heard of and used was Angie's List, with six participants using the site. None of our participants had heard of Kiva.org, TaskRabbit, or Yerdle, though a couple of participants had heard of Airbnb, ODesk, SkillShare, and FreeCycle. In terms of other job-finding applications, all participants had heard of CareerBuilder and 16 had used it to look for jobs. Nineteen respondents had heard of Craigslist; only two, however, indicated in the session that they had responded to our Craigslist ad. The majority of our participants responded to a local unemployment office solicitation.

Although 16 participants indicated that they would be likely to use a social network site that could be used for professional networking, only five used LinkedIn, two of which used it "a little." In the open-ended response section, one participant stated that he or she had "signed up for LinkedIn but rarely use[d] it," and that he or she had "not seen the full value of it." This participant also wrote, "As for F[ace]B[ook], it is a social place to me and I am irritated by people advertising for their home-based businesses." In other words, Facebook was not seen as a place to find jobs; rather, it was seen as a place where one participant felt irritated. Finally, when asked the best three methods of finding jobs, the majority of participants felt that the top factors included being educated (N=18), having existing connections (N=18) and either socializing with others at community events (N=12), or being wealthy (N=7). Other options included in participants' top three included talking with neighbors and having lots of friends.

Our survey data suggest that participants perceived barriers to employment that we believe sharing economy applications could lower or eliminate. Access to public and private transportation, for example, was an employment barrier for six participants, and seven participants had no access to private transportation. Sharing-economy applications such as Uber and Lyft could help participants lower this barrier and a few had heard of Uber (N=5) and Lyft (N=4). However, only one participant had used either of these applications.

Participant community-trust scores were slightly less than the national average. While the 2012 Civic Life in America report found that 57% trust all or most of their neighbors [4], only nine, or roughly half of our participants, would trust neighbors enough to hire them. Eleven participants would be willing to perform tasks for their neighbors. Nearly half of the participants distrusted police and public officials in their communities, and indicated that they would move away from their neighborhood if they could. The most common reasons for wanting to move away were high crime rates and a lack of opportunities.

Collaborative consumption principles revisited

As stated above, we used data from the response sheets and Learning Activity transcripts to address our key research questions. Below, we report on the results of our analysis based on Leadbeater's four principles of collaborative consumption. The results of this analysis provided us with 1) new success criteria for the sharing economy, and 2) information about which applications were the least or most likely to succeed and why.

Trust between strangers: On their surveys and response sheets, half (N=10) of participants indicated they trusted strangers. Eleven participants cited other aspects of trust such as privacy and safety as concerns. For example, NeighborGoods participants indicated that they would be more willing to share if the system could help provide a safe location for exchanges (e.g., local police and fire stations). Most participants were unwilling to share their home locations or show their photos (e.g., Airbnb, NeighborGoods, TaskRabbit). None of the Lyft group members were comfortable providing credit card numbers to the system or paying Lyft drivers via their mobile phones. Participants expressed the highest level of concern about TaskRabbit due to trust and safety concerns. While participants understood the purpose of a required background check for the person being hired to perform the task (e.g., the Rabbit or consumer), they also wanted the person listing the task (e.g., the producer) to undergo a background check as well. This is akin to making worker-employer relations visible as proposed by Irani and Silberman [16]. Many of these results suggest distrust in the technology, or in the sharing economy platform itself.

Idling capacity: Seventeen participants reported having access to spare resources. Only one out of three Lyft participants had a car that met the Lyft criteria at the time (e.g., a car year 2000 or newer with 4 doors); two out of three Airbnb participants had an extra room to share. Those evaluating Neighborgoods had extra goods such as clothes and toys that they would be willing to lend; those evaluating TaskRabbit listed skills such as painting, cleaning, and lifting boxes.

Critical mass: The response-sheets results indicated that achieving critical mass was a key concern. As defined earlier, critical mass ensures that customers within the sharing economy feel that enough choices exist for them to feel satisfied. Critical mass is also needed for 'social' proof. We analyzed questions categorized as critical mass (e.g., *items I would be willing to lend, or tasks I would be willing to do; items I would like to borrow*) for each application. NeighborGoods and TaskRabbit resulted in the greatest number of shareable items and tasks that could be performed. Participants equated Lyft to a car-sharing or cab service, which was needed in the community; they equated Airbnb to a hotel service. Specific concerns around critical mass included an unwillingness to share space for privacy reasons (Airbnb).

The key concern regarding critical mass, however, is related to the fact that half of all NeighborGoods and TaskRabbit participants were unwilling to borrow from others, or have others perform tasks for them. For example, for NeighborGoods, some participants were more than willing to lend but indicated the need to remain independent from others. According to the Learning Activity transcripts, three NeighborGoods participants stated: "I like to be able to have my own things; I don't borrow things from people; I try to provide my daily needs."

We found similar statements from other groups' Learning Activity transcripts. For example, one participant from the TaskRabbit group stated, "I like to do things for myself." Another participant blamed a bad past experience for her current unwillingness to hire someone. She also expressed a preference for doing things on her own. The preference for independence was also apparent among other participants. During report outs, for example, one participant stated

> I don't need to trade anything because I believe in buying, sell[ing] and mak[ing] money. But if I'm going give you anything…I don't look for it back.

Belief in the commons: According to the results of the response sheets (N=14) and transcriptions, belief in the commons was strong. The majority of participant statements focused on the potential employment and monetary benefits that could be achieved, which may indicate key priorities in the community at this time:

> We could all save money and get rid of things that we would never use or want anymore.
>
> It will create revenue in the community.

Other participants described the benefits of collaborating and sharing with one another. One participant stated, "we all need each other." Similarly, another stated that these applications could work in his community, "Because I see in my neighborhood a potential for harmony."

A small number of participants (N=4) was certain that the sharing economy would not work because of their current neighborhood situation. In one case, a participant stated that his community was "unproductive"; another noted that the constant turnover of neighbors would likely interfere with sharing goods and services. This suggests a lack of collective efficacy and a need for community and trust building as proposed in [7].

Mitigation strategies

The audio transcriptions of each group and sub-group conversations gave us insight into the perceived infeasibility of sharing-economy applications among participants. Overall, we identified 40 unique categories and sub-categories that included privacy, safety, shareable/non-shareable items, and barriers to sharing. We were also able to validate findings and anticipate categories from prior research such as trust, distrust, and barriers to employment. However, in this section, we describe mitigation strategies for some of the trust and safety issues that participants identified. We also discuss participants' suggestions for improving future sharing-economy and employment applications resulting from the design activity.

We analyzed transcripts to identify discussions related to overcoming the perceived lack of safety and trust. These included the importance of meeting in safe spaces, the need for understanding neighborhood makeup and cohesiveness, and the value of referrals.

Meeting in safe physical spaces and two-way background checks: Safety was an issue raised primarily by participants evaluating NeighborGoods and TaskRabbit. They felt comfortable meeting in safe physical spaces such as police stations and fire departments to exchange items:

> Like, just dealing with Craigslist…people have gotten robbed on numerous occasions just meeting up with people. So I think a police station… If a person has a problem with going to the police station, it's probably somebody you want to stay away from.

Participants also discussed the need for TaskRabbit and NeighborGoods regulations. As mentioned earlier, participants thought the background checks and application process for TaskRabbit were good; however, they felt that this should not be limited to those providing tasks. To become a "rabbit," or a person who performs tasks for hire on TaskRabbit, participants requested that background checks be done on those posting tasks as well:

> The employees, they go through a screening process and stuff like that, but what about the client, the consumers? They might be going to work for a rapist or a serial killer.

Creating the perception of "Good neighborhoods": Some participants perceived that neighborhood makeup and cohesiveness were factors that contributed to the success of sharing-economy applications. For example, the NeighborGoods team as a whole supported the application. One participant described why the application would work in her neighborhood while recognizing that NeighborGoods may not work in all neighborhoods:

> I do live in a good neighborhood; my neighborhood is mixed. My neighbors are well off.

Another team member challenged this statement and explained, "Just because they have a lot of stuff doesn't mean they're good neighbors." The participant responded that she was not strictly referring to finances; rather, her statement was based on the friendliness of her neighbors and the diversity in family makeup (e.g., not all single moms but also two-parent families with kids).

One group member evaluating TaskRabbit brought up the same issue of neighborhoods and described his neighborhood as *"unproductive."* He explained,

> It's sad to say, but it's true. All they [the neighbors] do is cause trouble. Quality of life has been on a down spin. So, I wouldn't allow anybody in my community [unless I've known them for many, many years and know what they are capable of] to do anything for me.

"It's who you know": Knowing individuals and their capabilities personally made it more likely for people to hire from a system such as TaskRabbit. A referral from a friend or family member was another way for participants to alleviate lack of trust. Participants were skeptical of the reputation established by TaskRabbit as they did not know the people who made the recommendations. When discussing TaskRabbit's existing reputation system, one participant stated,

> I don't know what I think about that. 'Cause I know people and if they don't know you…they aren't too receptive. You have to be referred by somebody.

Participant employment solutions

Our design activity revealed three key themes. On the positive side, participants described the potential advantage of increased collective efficacy and increased "linking ties." The third theme reflected concern on the part of a few participants about the possibility of online exploitation.

Increased collective efficacy: Both NeighborGoods groups encouraged relationships outside the platform by adding features that allowed for bartering of skills and services. Participants wanted to build platforms facilitating sharing among trusted neighbors and advertise within the community. At least three NeighborGoods participants across both workshop sessions agreed that NeighborGoods could be used for advertising within their community. One participant built upon the idea and suggested leveraging Facebook as the platform:

> Like in Facebook…we share things that we see; those memes and stuff like that…you could do that with a job [posting]. You could see it, and maybe you could take a picture of it or something like that, upload it and then share it to your news feed or something like that.

The group members discussed the support system inherent in this idea—e.g., Facebook posters would be helping their communities by sharing local job opportunities.

Increased "linking ties": Woolcock discusses linking social capital, which connects groups and individuals to those in authority [32]. An Airbnb participant describes an application for younger adults, which connects them to business persons in positions to provide internships and direction:

> How many people here feel like they're kind of stuck in their life, and don't know exactly where to go? …We thought of MAPS, Multiple Alternative Pathways to Success, where you can go and grow in the areas that you see fit. So, why not identify resources for young people in businesses and intern opportunities where people could actually connect real time with these resources and really identify where they will be interested in going and growing.

Team members from two other groups expanded on the idea of information sharing by suggesting ways to link to hiring professionals. As one participant described:

> Sometimes people need a little bit more to get better prepared…they may have been out of school 20 years…they need a little bit more to get more acclimated to feel comfortable and confident when they go on and take these tests. Otherwise you get test anxiety 'cause you're not quite confident and not familiar with the material….A[n] app that can kind of do[es] pre-testing and that can help you with your confidence level, your skill level, interviewing process. Something job related, like writing and preparing resumes, most common[ly] asked questions and how to interview.

Two TaskRabbit group members from the second session noted that finding jobs was not a problem—they were interested in understanding how to *land* a job. The team members requested an application that could provide:

> Automatically generated messages that lets the person know why they were rejected from a job.
>
> Something simple that somebody could use to improve themselves…'Dear Bobby, we can't help you with employment at this time, your reading level was very low, and so was your math level.'

These suggestions are similar to what employment-related applications such as LinkedIn provide but were rarely used by our participants. Participating in the sharing economy could connect individuals to others able to make hiring decisions, or could provide employment tips; however, the barriers identified earlier must be mitigated.

Technology and exploitation among marginalized communities: The use of technology for exploitation resurfaced in the final activity. The first instance was from

a participant who responded in the open-ended survey that he did not use Facebook due to his irritation with targeted advertisements. In the second instance, a participant shared her story about being hired to contact individuals who had clicked on an employment ad sponsored by a for-profit university. After getting their contact information, she was tasked with calling each person to obtain approval to receive weekly or daily job alerts. She was then told to connect the customer to a career advisor who would try to convince the individual to enroll in the for-profit university. The participant felt bad about what she was doing and explained how the online ads were using a person's unemployment status to lure them into more debt. She shared that the company fired her for being "too passive."

> It's like going home at the end of the day hearing people's stories about how they couldn't get a job. It just made me sad. I feel like I'm lying.

DISCUSSION

Overall, our results show promise for potential benefits of the sharing economy in these communities. In analyzing our results based on Leadbeater's four principles of collaborative consumption, all participants believed that the sharing economy applications could help with employment and/or saving money. Another promising finding was that participants were aware of sharing economy applications such as Uber, Lyft, AMT, Angie's List and a couple had heard of AirBnb, ODesk, Skillshare and even FreeCycle. In addition, idling capacity, or access to spare resources was not identified as a major concern. Addressing issues related to privacy and security, as hypothesized in [17] could further benefit these populations. We discuss three themes that arose from our data analysis of the target population, which suggest further expansion of Botsman and Rogers' principles: 1) trust in the sharing economy; 2) conditions for critical mass and belief in the commons; and 3) linking and vertical capital.

Trust in the sharing economy

As discussed in the related work, a sharing economy is not new among these populations. What *is* new is having trust in technology to support the sharing economy. This is distinct from trust between strangers. Trust in technology is a security issue related to the protection from harm and includes the ability to use technology: to have a safe financial transaction online, to use technology without being exploited, and to facilitate safe transactions in physical places.

Participants distrusted aspects of the sharing economy related to monetary transactions and to sharing their personal data. For example, participants were hesitant to: pay bills using cell phones, share their location, display photos, and provide a link from sharing economy applications to other accounts, such as Facebook. This finding corresponds to past research indicating that mistrust often prevents African Americans from using Internet tools for fear of access to personal information such as race, age, and gender [12]. Nevertheless, participants described having more trust if a personal connection referred them to the application or service. In fact, Karlan et al. propose an economic model to secure informal borrowing with network connections between individuals. They suggest that hiring workers through referrals, or existing network connections, could create trust [18]. While the current reputation system internal to the sharing economy does not allow for referrals, this could help to secure trust in the future. Researchers in the CHI community have already identified potential benefits of sharing healthy eating experiences [15]—perhaps this work could be extended to sharing positive experiences with workers of the sharing economy. While some applications do not assume the responsibility for the risk of item exchange among strangers (e.g., Craigslist), other applications (e.g., Uber) offer cashless transactions and traceable data (e.g., personal information) in case a transaction goes wrong. Similar support for alternative transactions (e.g., trading items in physical spaces) could mitigate these concerns.

Conditions for critical mass and belief in the commons

Our results suggest a need for balanced reciprocity, collective efficacy and income generation for the sharing economy to work best among marginalized communities. We saw the reluctance among some NeighborGoods and TaskRabbit participants to borrow from others and to have others perform tasks for them. This was due to participants' needs to feel independent. Belief in the commons was strong among our participants; however, a small number of participants felt that their communities were "unproductive" and that sharing is difficult among transient communities. There also seemed to be an implicit promise that the sharing economy would bring money into the community.

Reciprocity creates a cycle of exchanges that bonds individuals and is a powerful mechanism of solidarity and social integration [26]. Past social work research found that extensive reliance on network members for support can lead to negative feelings of degradation, guilt, isolation, and discouragement [24]. Low-income communities have strong norms against constantly taking more than one can give, and maintaining balanced reciprocal relationships is important [8]. Whereas the sharing economy offers an opportunity to save resources through sharing, some individuals may have a mindset to remain independent and to provide for themselves. One group suggested improving upon NeighborGoods to support bartering and leveraging the platform to advertise each other's skills, a form of reciprocity. This finding is similar to the results of an ethnography conducted in a poor Southside Chicago community, which found that the use of such bartering systems helped to build trust within the studied community [32]. How can the sharing economy show or encourage balanced reciprocity?

Some participants lived in "unproductive" and/or transient neighborhoods and had low neighborhood collective efficacy. Neighborhood collective efficacy relates to the sense of belonging an individual feels for his or her community, the degree of social interaction within a community and the willingness of neighbors to work together on community issues [28]. It is also understood to be a specific form of group-level social capital [25]. Having low collective efficacy within a neighborhood could pose challenges for the shared economy. Interestingly, past research finds that diversity in ethnicity, occupation, and household type (e.g., dual versus single-parent households) suppresses collective efficacy presumably in cases of high neighborhood turnover [25]. Some participants felt that the sharing economy applications would not work due to neighborhood transiency. One participant perceived that her neighborhood was "well off" because her neighborhood consisted of both single- and dual-parent households. The same research finds that collective efficacy is enhanced by diversity in education and income [25]. This may suggest that these applications could be more successful in neighborhoods with households diverse in education and income. Further research is needed to learn which neighborhood factors, if any, are associated with successful digital-sharing economy uptake.

We stated earlier that sharing and bartering are common among low-income communities; however, most of the sharing that has occurred has not led to income generation [5]. Our participants had a strong belief in the commons and saw the potential for the sharing economy to bring employment and money into the community. Past research has investigated a strategy for technology to foster local wealth generation by keeping track of the number of times currency circulates in a given community [20]. This type of application could lead to similar benefits to low-income communities. However, the social networks in low-income communities may not be able to yield substantial returns to their community members [5]. Given that low-income communities are often isolated (e.g., by geography, race, and class) from affluent communities, these communities are less likely to be in positions of power than affluent communities [5]. Past research suggests that providing low-income individuals access to those from different socioeconomic positions could lead to mutually beneficial relationships [8]. An opportunity and challenge for the digital-sharing economy is to foster these relationships.

Increasing linking and vertical capital

Consistent with findings from the previous section, past sociology research [5, 8], and past HCI findings of disadvantaged communities [7, 11], individuals in these communities requested linking ties to foster economic development. The promotion of vertical associations and a link to financial capital could lead to economic growth [19]. Though only one suggestion (e.g., connect people with individuals in businesses that have the capacity to provide internships for young people) aimed to extend connections beyond the network and community, participants indicated in their surveys that obtaining an education and making external connections were the best ways to find a job. Participants did request employment ICTs that could provide special training, a form of education, to help them land a job. It is possible that sharing economy applications that provide skill bartering, training, and access to financial capital (e.g., Skillshare, Kiva.org) could help to increase vertical capital among individuals in disadvantaged populations. Individuals saw opportunities for temporary employment within applications like TaskRabbit to lead to longer-term employment. However, they did not trust the shared economy platform to facilitate the hiring of trust-worthy individuals. Working through these barriers may uncover opportunities for service-based sharing economy applications to succeed among these populations as well.

LIMITATIONS

While this work opens new avenues for researchers to explore, there are limitations, which we aim to address in the future. For instance, our participants were from only one urban community—other communities may be different. Nevertheless, we identified new and supported existing concerns based on prior research that are unique to disadvantaged populations. Further, due to the sample size, we were unable to conduct more sophisticated statistical analysis and to validate the survey instrument. Given our results, this would be a worthwhile future effort.

CONCLUSIONS AND FUTURE WORK

To the best of our knowledge, this is the first study to identify success factors of the digital-sharing economy for individuals that are un(der)employed, financially constrained, or from disadvantaged neighborhoods. We found that the digital-sharing economy was not completely new among these populations, and some participants were aware of and using several applications already. We also identified shortcomings and suggested new principles and conditions that may benefit marginalized populations. The lack of trust in the sharing-economy platform is an obstacle among these communities. To further support critical mass and belief in the commons, we contributed balanced reciprocity, collective efficacy, and income generation through "linking" and vertical capital. These also serve as the basis to new concepts for practical employment applications among this population. Our next steps include exploring the use of referrals in the sharing economy and building and deploying participant suggestions for employment applications.

ACKNOWLEDGEMENTS

We would like to thank participants of this study and the Detroit Center staff, and feedback from our anonymous reviewers, UMSI students, faculty, and Lisa Gonzalez. The NSF grant IIS-1352915 supported this research.

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