THE DUALITY OF EMPOWERMENT AND MARGINALIZATION IN MICROTASK CROWDSOURCING: GIVING VOICE TO THE LESS POWERFUL THROUGH VALUE SENSITIVE DESIGN

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Crowdsourcing (CS) of micro tasks is a relatively new, open source work form enabled by information and communication technologies. While anecdotal evidence of its benefits abounds, our understanding of the phenomenon’s societal consequences remains limited. Drawing on value sensitive design (VSD), we explore microtask CS as perceived by crowd workers, revealing their values as a means of informing the design of CS platforms. Analyzing detailed narratives of 210 crowd workers participating in Amazon’s Mechanical Turk (MTurk), we uncover a set of nine values they share: access, autonomy, fairness, transparency, communication, security, accountability, making an impact, and dignity. We find that these values are implicated in four crowdsourcing structures: compensation, governance, technology, and microtask. Two contrasting perceptions—empowerment and marginalization—coexist, forming a duality of microtask CS. The study contributes to the CS and VSD literatures, heightens awareness of worker marginalization in microtask CS, and offers guidelines for improving CS practice. Specifically, we offer recommendations regarding the ethical use of crowd workers (including for academic research), and call for improving MTurk platform design for greater worker empowerment.

Keywords: Crowdsourcing, societal impacts, crowd worker value, ICT ethics, empowerment, marginalization, value sensitive design, open source, Amazon’s Mechanical Turk, microsourcing, gig economy, on-demand workforce

“There’s no place for us to be heard if we’re taken advantage of or treated unfairly. We’re many, and invisible, and easily replaced. So we’re ignored.”  
(A 33 year-old MTurk worker)
Introduction

Advancements in information and communication technologies (ICT) are impacting many facets of our society. One such impact is apparent in the rapidly growing phenomenon of crowdsourcing (CS), an open source work form, enabled and mediated by the Internet and social media. CS is the practice of obtaining needed services and content by soliciting voluntary contributions in the form of an open call from a large network of individuals rather than from an organization’s employees or suppliers (Howe 2006). CS occurs in such forms as micro work, creative CS, and inducement prize contests (Howe 2008). It radically changes the nature of work: rather than being confined to offices and stipulated office hours, people can conduct work at home, choose when to work, and decide which jobs to perform. CS, thus, appears very attractive—on the surface, that is.

CS has attracted wide attention in industry and academia. Anecdotal evidence indicates that CS is changing people’s perspectives on managing their work–life balance. Prominent articles in the popular media include one in The New York Times on how individuals are able to participate in social change through CS (Rosenberg 2011), and an announcement by Ladies’ Home Journal to crowdsource its publishing content to readers rather than relying solely on professional journalists (Sivek 2012). The demand for microtask CS is one of the most rapidly expanding trends (Bratvold 2011). Compared to regular jobs in a “traditional” organization, these micro tasks are simple (e.g., can be completed in a matter of minutes) and are compensated with tiny monetary rewards. According to a survey of registered workers on Amazon’s Mechanical Turk (MTurk), the average U.S. MTurk worker earned $2.30 per hour in 2009 (Ross et al. 2010). Academic work includes Deng and Joshi (2013), who explored crowd workers’ perceptions of microtask CS as a career choice, finding that work flexibility and work autonomy were the two major positive aspects. They also highlighted concerns about workforce marginalization, however, given commonplace complaints regarding low levels of compensation.

It therefore remains unclear whether microtask CS provides a platform that empowers workers to craft their careers or creates a sweatshop environment where workers are completing fragmented tasks for minimal pay. Thus, although CS can afford worker autonomy and flexibility, it can also make workers vulnerable to exploitation. The power asymmetry provides opportunities for abuse, with fairly benign workshops potentially degenerating into digital sweatshops: “given the short time commitment between crowd worker and requester, it is easy to imagine heightened exploitation and dehumanization” (Kittur et al. 2013, p. 10).

In line with Desouza, Ein-Dor et al. (2007), Desouza, El Sawy et al. (2006), and Wastell and White (2010), the onus of critically evaluating the microtask CS phenomenon to direct its use to empower crowd workers and prevent its misuse lies, in part at least, on us as IS scholars. This special issue on societal challenges of ICT offers an opportunity for just such critical reflection. Hence, we give voice to the crowd workers who are less powerful but most affected by the values implicated in the design of microtask CS platforms. The primary goal is to reveal causes of the rising concerns related to microtask CS and to propose research that focuses on means by which these may be ameliorated. Broadly, the objective is to highlight evidence of empowerment and marginalization in CS environments, which could then lead to uncovering means of accentuating worker empowerment while reducing worker marginalization. Thus, our study responds to the challenges posed by this special issue by (1) providing a rich description of an emerging paradox of worker empowerment and marginalization in this context, (2) advancing theoretical understanding of the societal challenges of this emerging phenomenon, and (3) proposing a novel, ethical design perspective for incorporating moral import to cope with associated societal challenges.

To explore worker values that could be foundational in designing CS platforms, we draw on value sensitive design (VSD) (Friedman 1996; Friedman and Khan 2003; Friedman et al. 2006) in analyzing the narratives of MTurk crowd workers. As a well-established online CS marketplace with a large pool of job seekers and requesters, and a variety of work, MTurk makes for a suitable context for our study. Our analysis reveals a set of nine worker values (access, autonomy, fairness, transparency, communication, security, accountability, making an impact, and dignity) implicated in the four CS structures (of compensation, governance, technology, and microtask), which are associated with perceptions of empowerment and marginalization. We explain why these dual impacts of CS may be inseparable and propose future research directions based on our findings. We do so with the objective of reducing power asymmetries among crowd workers, job requesters, and those who host CS platforms. This, we argue, could result in fostering a more trusting work environment where crowd workers are better appreciated and less resentful. Theoretically, we advance the broad field of design research by extending the VSD literature and by introducing a value-centric design perspective. The study also advances theoretical understanding of microtask CS by articulating crowd worker perspectives and values and by revealing the dynamic interrelationships between values and the two opposing experiences of empowerment and marginalization.

The remainder of the paper is organized as follows. Next, we summarize relevant microtask CS literature and review key
concepts in VSD. We then describe pertinent research methods before presenting our findings. There follows a discussion on the duality of empowerment and marginalization resulting from the interplay between worker values and current CS designs. We then discuss our theoretical contributions and outline design and practice implications before concluding the paper by means of a number of reflections.

**Microtask Crowdsourcing**

Microtask CS is an open source form of micro work for micropayment. Consistent with Howe (2008), we define microtask CS as a type of online, participative activity in which undefined, generally large groups of individuals take on micro tasks posted on a web-based, third-party platform in an open call by organizations or individuals in exchange for micropayment. In addition to MTurk, examples of microtask CS include MobileWorks² and CrowdFlower.³ These three largest microtask CS platforms aggregate hundreds or thousands of tasks performed by multiple suppliers from a large pool of approximately 400,000 workers (Kaganer et al. 2013). We refer to those individuals who perform micro tasks for micropayment as *crowd workers*, those who post micro tasks as *job requesters*, and those web-based, third-party platforms as *crowdsourcing platforms* (or CS platforms).

Based on our CS literature review, research on microtask crowdsourcing can be organized around its four key structures: technology, governance, microtask, and compensation. First, the *technology structure* refers to the IT infrastructure used to build the CS work environment. Research on technology structure focuses on technical functionalities to meet stakeholder needs. For instance, Kajino et al. (2014) proposed a CS quality control protocol to be imbedded in the technical system so as to allow a job requester to assess the quality of results while preserving worker privacy; Saito et al. (2014) proposed a framework of three core modules—tutorial producer, task dispatcher, and feedback visualizer—supported by a back-end skill assessment engine to enable micro-tasking of skill-intensive work; and Geiger and Schader (2014) developed personalized task recommendation mechanisms to better match CS tasks and workers’ individual interests and capabilities. Second, the *governance structure* refers to CS work practices, standards, and policies. Research has highlighted the importance of the governance structure in terms of challenges in managing large, external groups of people—referred to as an on-demand, scalable workforce (Greengard 2011) or the “human cloud” (e.g., Kaganer et al. 2013)—handling a variety of tasks (Schenk and Guittard 2011) that have traditionally been associated with small, specialist groups in organizations (e.g., Kittur et al. 2013). Third, the *microtask structure* refers to the properties of CS jobs. Designs of the CS microtask structure (e.g., instructions, configurations) drive worker participation (Chandler et al. 2013) and enhance worker productivity (Finnerty et al. 2013; Moussawi and Koufaris 2013). Finally, the *compensation structure* refers to payment arrangements for CS jobs. Scholars (e.g., Finnerty et al. 2013; Kittur et al. 2013) have evaluated the CS compensation structure (e.g., payment rates and monetary rewards for completed microtasks) as an important factor for job requesters, especially when job requesters consider these sourcing opportunities. (For a more detailed review of the CS literature, refer to Appendix A).

While prior studies focus on efficiencies in these four structures, systematic investigations regarding the intended or unintended ethical consequences of these new work structures have been largely absent. Societal concerns regarding ethical standards and practices that primarily focus on microtask compensation structures are increasing (Schmidt 2013; Silberman et al. 2010); job requesters may be using these new work structure forms to bypass commonly established ethical standards to their advantage (Harris 2011), complicating the application of existing work laws to crowd labor (Felstiner 2011). In addition, prior studies, with the exception of Brabham (2012) and Silberman et al. (2010), consider job requester or CS platform owner perspectives, paying little attention to the views of crowd workers. Yet, crowd workers, the key stakeholder, cannot be ignored if one cares about microtask CS’s long-term impact on society. Research at the intersection of ethics and CS work structures is warranted. We aim to fill this gap by improving our understanding of this emerging, complex phenomenon and giving voice to the crowd workers themselves.

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²https://www.mobileworks.com/
³https://www.crowdflower.com/
VSD is a value-oriented design methodology commonly adopted in human–computer interaction (HCI). Developed by Friedman (1996) and Friedman and Khan (2003), VSD is a “theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner” (Friedman et al. 2006, p. 2). Studies on ICT and ethics have historically placed emphasis on enduring human values (e.g., Wiener 1950, 1954, 1964). VSD seeks to understand how human values (e.g., welfare, accountability, autonomy, freedom from bias) can be accounted for in the design of computer technologies. Values are not facts, but are derived subjectively, based on the interests and desires of human beings within a sociocultural milieu (Friedman et al. 2008).

In capturing and prioritizing human values in design, VSD proposes a three-part methodology that includes conceptual, empirical, and technical investigations to guide design (Friedman and Khan 2003; Friedman et al. 2006). These investigations are applied iteratively, with findings from new investigations building on earlier results. Conceptual investigations focus on theoretically and philosophically informed analyses of central constructs and issues, which result in working conceptualizations of the values under investigation. The empirical work seeks to understand human responses to technical artifacts and to the larger social context of technology use. Technical investigations can be either retrospective analyses of existing technologies or proactive design of systems to support values identified in the conceptual or empirical investigations. The distinction between the technical and empirical investigations lies in their unit of analysis. Technical investigations examine the technology; empirical investigations capture the responses of individuals, groups, or communities that are involved in and/or affected by the technology (Friedman et al. 2008).

We use the human value constructs of VSD to theoretically and philosophically underpin our empirical investigation. The technical investigation (undertaken with a view to support crowd worker values through retrospective or prospective assessments) of the MTurk platform (comprising multiple work structures) can be undertaken only after salient values are identified in the conceptual and/or empirical investigation. VSD research commonly relies on case studies in discussing how to account for human values in ICT designs. Table 1 summarizes illustrative VSD studies.

Friedman and Kahn (2003) provide a classification of values (referred to as a collection of 12 “human values with ethical import”): human welfare; ownership and property; privacy; freedom from bias; universal usability; trust; autonomy; informed consent; accountability; identity; calmness; and environmental sustainability. This set of values, as Friedman et al. (2006) indicate, is open to refinement. While appraising the positive impact of VSD on technology design, Le Dantec et al. (2009) point to its limitations, viewing VSD as a design methodology, promulgating an agenda of design on a largely fixed classification of values, rather than inquiring about the values present in a given context and responding to those values—being sensitive to those values—through design (p. 1143).

Thus, they argue that user values should be empirically revealed before being used to design or refine systems. Consistent with this argument, we conduct this exploratory study to reveal crowd worker values that can be embodied in the design of CS work structures (e.g., governance, technology, compensation, and task). We now turn to these research considerations.

### Research Methods

We conducted an in-depth, interpretive field study to investigate which aspects of CS platforms are appreciated by crowd workers and which contribute to empowerment and marginalization in microtask CS. Consistent with interpretive approaches to IS research (as outlined, for example, by Galliers and Land 1987; Orlikowski and Baroudi 1991; Walsham 1995), our research objectives were to investigate how human actors (crowd workers) made sense of their participation in the CS work environment, rather than to hypothesize or test cause-and-effect relationships. Informed by earlier theorizing and by our empirical study, our goal was to develop an analytical generalization regarding worker values and their experiences with the open, online labor marketplace mediated and enabled by ICT. This generalization could prove useful for further research on other types of CS and ICT-enabled work contexts. Our approach is consistent with Klein and Myers’ (1999) principle of abstraction and generalization for interpretive field studies, and Lee and Baskerville’s (2003) framework for generalizability (i.e., empirical to theoretical generalization).

Amazon’s Mechanical Turk (MTurk)\(^4\) provided an opportunity to collect rich case study data in a setting where the

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\(^4\)The MTurk platform has been increasingly used by researchers from different disciplines for field experiments. Examples include Alonso and Mizzaro (2012) on using the MTurk platform as a cheap, quick, and reliable alternative for relevance assessment of information retrieval, and Chandler and Kapelner (2013) for running natural field experiments in economics. Mason and Suri (2012) provide detailed guidelines on how to use Amazon’s MTurk website to conduct behavioral research. Utilizing such platforms as MTurk as an alternative to student surveys is proposed in Steelman et al. (2014).
phenomena we hoped to observe were likely to be widespread (Yin 1994), and allowed us to observe first-hand the different aspects of worker empowerment and marginalization from the perspectives of crowd workers themselves. Our data analysis was based on such qualitative research methods (open coding, analytical categories informed by prior research, data display matrices) as articulated by Miles and Huberman (1994). The following section describes the research site before detailing data collection, coding, and analysis.

**Research Site and Microtask CS Description**

MTurk is a platform that offers access to large numbers of job requesters and crowd workers to engage in a variety of microtasks. MTurk provides free access and services to crowd workers by allowing them to select and perform tasks for monetary reward. According to a recent browsing of the MTurk website, there are now more than 400,000 workers registered and over 395,700 tasks available (March 27, 2015) (see also Satzger et al. 2013). The website refers to the microtasks as “human intelligence tasks” (HITs), which typically involve fairly simple tasks, such as video and audio transcription, classification, and document categorization.

The MTurk website allows workers to search for HITs using a predefined set of criteria and allows job requesters to create and publish micro tasks by using a web service-based interface. The CS platform provides job requesters with the possibility of publishing simple task descriptions in a database to which all workers have access. Task descriptions comprise a title, HIT type, text description, expiration date, time allotted, keywords, required qualifications, and monetary reward. MTurk recommends (but does not enforce) job requesters to offer $0.1 for one minute’s work, equivalent to $6.00 per hour. At the time of the study, MTurk charges a 10 percent commission⁵ based on payments made, but charges 30 percent when a micro task requires completion by MTurk Masters. The FAQs posted on the website (https://requester.mturk.com/help/faq) provide general guidelines, including information on the types of HITs that violate MTurk policies (e.g., HITs requiring disclosure of a worker’s identity or e-mail address, or asking workers to solicit third parties).

**Data Collection**

We collected data via MTurk by using a survey instrument (Appendix B), which included both semi-structured and unstructured questions on worker experiences. Rather than directly asking what crowd workers value most in microtask CS work, we employed the indirect approach suggested by Friedman et al. (2006); that is, we asked them to describe how and why they started to participate in the CS workforce and how they felt about taking jobs on MTurk. This approach helps to “engage people’s reasoning about the topic under in-

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⁵Starting July 22, 2015, Amazon increased its charge to Job Requesters from 10% of the reward and bonus amount (if any) that Job Requesters pay workers per HIT to 20% and updated the charge for using each Master Qualifications to 25% (http://mechanicalturk.typepad.com/blog/2015/06/following-up-on-our-commission-structure.html).

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<table>
<thead>
<tr>
<th>Reference</th>
<th>Technology</th>
<th>Value</th>
<th>Objectives and Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friedman et al. 2002</td>
<td>Mozilla browser</td>
<td>Informed consent in online interactions</td>
<td>Development of new technical mechanisms for cookie management in a web browser.</td>
</tr>
<tr>
<td>Friedman et al. 2006</td>
<td>(1) Web browser; (2) high-definition; plasma display; (3) urban planning simulation system</td>
<td>(1) Information and control of web browser; (2) physical and psychological well-being and privacy in public spaces; (3) diverse range of values by different stakeholders (environmental sustainability, business expansion opportunity, neighborhood walking safety).</td>
<td>Engaging VSD in the design of computer systems for various stakeholders.</td>
</tr>
<tr>
<td>Miller et al. 2007</td>
<td>Groupware system</td>
<td>Privacy, awareness, and reputation</td>
<td>Technology and organizational policy coevolve. New design methods (value dams and flows).</td>
</tr>
<tr>
<td>Le Dantec et al. 2009</td>
<td>(1) Mobile technology use by homeless; (2) RFID in passports, credit cards and retailers; (3) home technology</td>
<td>(1) Staying connected with family and friends; independence (or autonomy); (2) justice and accountability; (3) quality, durability, and sustainability.</td>
<td>Attending to and engaging local expressions of values (the values present in the technology use context) in the design.</td>
</tr>
</tbody>
</table>
vestigation” (ibid., p. 19). In addition, we asked them to share their experiences in completing their favorite types of HIT. The survey also included questions about their MTurk tenure (how long they had been working in CS), CS efforts (hours and HITs on a weekly basis), and their demographics (e.g., gender, age, education, employment status, household income).

The survey was published on the MTurk website in the form of a survey HIT. Workers were able to choose to take the survey and be compensated, as with any other type of HIT. Workers were compensated $2.00 for their response and they spent approximately 16 minutes on average on completing the survey, corresponding to a $7.50/per hour rate. The survey was well received, with the following responses being typical:

This is a very interesting survey; it makes me think a lot about why I do the work.

Thanks for the opportunity to think about my place at MTurk!

This is a very interesting survey. I hope you are passing the results of the survey along to [MTurk].

Our data sample included 210 individual responses by U.S.-based MTurk workers (110 females; 100 males) representing a diversity of employment types (full-time employed, part-time employed, otherwise unemployed) and others (student, retired, stay-at-home mom). More than one third of the respondents were employed full-time, and a quarter were employed part-time. On average, they spent 26 hours each week on MTurk, with a median 20 hours for full-time employed and a median 30 hours for unemployed. Table 2 summarizes the sample’s descriptive statistics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Age</td>
<td>35.0 (12.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) MTurk Tenure (Months)</td>
<td>15.2 (16.9)</td>
<td>.271***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Weekly HITs</td>
<td>958 (1539)</td>
<td>-.047</td>
<td>.084</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Weekly Hours</td>
<td>26.1 (16.1)</td>
<td>.093</td>
<td>.015</td>
<td>.409***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Gender</td>
<td>0.52 (0.5)</td>
<td>.169*</td>
<td>.170*</td>
<td>-.019</td>
<td>.007</td>
<td></td>
</tr>
<tr>
<td>(6) Consider CS as a career (Y/N)</td>
<td>0.47 (0.47)</td>
<td>.101</td>
<td>.141*</td>
<td>.252***</td>
<td>.389***</td>
<td>.114</td>
</tr>
</tbody>
</table>

The majority (over 75%) had received some college or higher education—bachelor’s degree (34.8%); some college but no degree (29.5%); graduate degree (11%)—with the remainder holding a high school diploma (12.9%) or an associate degree (11.9%). Annual household income for 39 percent of respondents was $25,000–49,999, with 22.9 percent receiving $50,000–74,999. The distribution of the remaining categories was: < $25,000 (18.6%); $75,000–99,999 (11%), and $100,000+ (8.6%). The average age of respondents was 35 years (SD 12.2) with, on average, 15 months’ (SD 16.9) experience of MTurk. Our survey respondents are distributed in the following age groups: 18–24 years (21%); 25–30 years (24%); 31–40 years (22%); 41–50 years (21%), and 51+ years (11%). The sample demographics are consistent with sample demographics of MTurk workers in prior studies (e.g., Berinsky et al. 2012; Goodman et al. 2013; Ross et al. 2010).

MTurk classifies HITs into seven categories: data processing, categorization, sentiment, tagging, content, business feedback, and academic survey. Our respondents undertook multiple types of HIT, with 60.7 percent of them performing all seven types of HIT, followed by 20 percent performing six types of HIT, and 10.7 percent performing five types of HIT. Only 8.7 percent performed four or fewer types of HITs. None undertook only academic or categorization HITs. Table 3 provides definitions and examples of the seven HIT categories.

**Data Coding and Analysis**

In the initial data coding, we used crowd worker statements to identify values that were expressed in relation to their CS experiences. We adopted Miles and Huberman’s (1994)
Table 3. Percentage of Crowd Workers (n = 210) Performing the Seven Categories of MTurk HITs

<table>
<thead>
<tr>
<th>Percentage* of Respondents</th>
<th>HIT Category</th>
<th>Definition and Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>98.2%</td>
<td>Academic survey</td>
<td>Involves completing surveys and participating in scientific studies.</td>
</tr>
<tr>
<td>74.5%</td>
<td>Categorization</td>
<td>Categorizing products or to check data accuracy in catalogs.</td>
</tr>
<tr>
<td>63.6%</td>
<td>Business feedback</td>
<td>Providing feedback to businesses, such as providing feedback on a company’s website design or new products.</td>
</tr>
<tr>
<td>61.8%</td>
<td>Sentiment</td>
<td>Requires rating sentiments present in tweets, press coverage and customer comments.</td>
</tr>
<tr>
<td>58.2%</td>
<td>Content</td>
<td>Ranging from reviewing and editing content to writing abstracts/articles on specific subjects.</td>
</tr>
<tr>
<td>56.2%</td>
<td>Data processing</td>
<td>Refers to those micro tasks on verifying data entry, collecting data or cleaning duplicate/incorrect data files.</td>
</tr>
<tr>
<td>36.2%</td>
<td>Tagging</td>
<td>Including generating key words for images, advertisements or websites for indexing and searching purposes.</td>
</tr>
</tbody>
</table>

*Note: The percentage indicates the proportion of respondents who performed that category of HITs; a respondent could select multiple categories.

coding strategy, undertaking data coding in multiple steps. First, two researchers determined the coding scheme of value categories based on prior VSD studies (e.g., Friedman and Kahn 2003; Le Dantec et al. 2009) and performed a pilot coding on eight sample responses (two responses from each of the four employment categories). New value categories emerged or were modified as a result. The two researchers then discussed the pilot coding results and refined the coding scheme. They then independently coded a random sample of 60 responses, discussed the coding, and resolved any coding disagreements. Table B1 in Appendix B provides examples of coding discrepancies and their resolution. The inter-rater reliability of coding is satisfactory, with a Cohen’s Kappa Index of 0.885, suggesting an acceptable level of agreement between the two coders (Ryan and Bernard 2000). Together, the two researchers coded one third of the sample, compared and discussed coding, and refined and finalized the coding scheme. Then, one coder followed the agreed coding scheme to complete coding of the remaining data. We assigned between one and eight values to a worker’s statements (average 3.7 values, median 3 values per worker). This iterative process resulted in nine value categories, summarized in Table 5 in the “Findings” section. Table B2 in Appendix B details the distribution of worker values by employment status, gender, education level, household income, and age group.

The coding of workers’ value statements revealed expressions of empowerment and marginalization. We coded the expression of empowerment into four dimensions (meaning, competence, self-determination, and impact) that are similar to those adopted by prior studies (Spreitzer 1995; Thomas and Velt-house 1990), reflecting an individual’s orientation to his or her work role. For coding instances of marginalization, we started with the definition that, to marginalize means “to put or keep (someone) in a powerless or unimportant position within a society or group” (http://www.merriam-webster.com/dictionary/marginalize). The coded responses that captured this sense of marginalization revealed feeling exploited (economic marginalization), deskilled (competence marginalization), constrained by the MTurk technical system (institutional marginalization due to technological features), and helpless vis-à-vis job requesters and the MTurk platform owners (marginalization due to institutional policy and practice). Each worker statement was assigned between zero and four empowerment types (average 2.1; median 2) and between zero and four marginalization types (average 1.3; median 1). The linkage between a coded value and the resulting experience of either marginalization or empowerment was also captured. The frequencies of marginalization and empowerment instances are summarized in Tables 6 and 7 in the “Findings” section.

Data analysis was undertaken iteratively. We first read the worker narratives and coded the statements to reflect the categories of values and the presence of stated feelings of empowerment or marginalization. For example, our coding revealed workers valuing the flexibility in choosing CS work, suggesting an “autonomy” value enabled by CS task structure (see Table 4). Our reading of the remaining statements revealed workers’ appreciation of flexibility and feeling inde-
Table 4. A Sample Matrix Illustrating the Data Coding Process

<table>
<thead>
<tr>
<th>Value Statements: What a crowd of worker considers important in life</th>
<th>Value Revealed</th>
<th>Value Category</th>
<th>Value Implicated in Current Design</th>
<th>Empowerment/ Marginalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>“There are at any time over 200,000 HITs of many different types available ... Since [they] take a short time, I can accept them 24 hours a day at my leisure, I can complete work on my computer anywhere ...”</td>
<td>Flexibility to choose a micro task.</td>
<td>Autonomy: Freedom and independence in job decision making.</td>
<td>The variety and micro nature of CS task (task structure) provide flexibility for workers to accept and complete a job in a short time.</td>
<td>Empowered through self-determination (Freedom and independence in choosing and completing CS jobs).</td>
</tr>
<tr>
<td>“The pay can be really atrocious, akin to sweatshop wages. It would be nice if everything had a fair wage.”</td>
<td>Value the fair rate of compensation for a micro task.</td>
<td>Fairness: Fairness in the rate of payment.</td>
<td>CS micro payment (compensation) fails to support fair compensation rate for some micro tasks.</td>
<td>Economic marginalization (feeling exploited).</td>
</tr>
</tbody>
</table>

Findings

Crowd Worker Values

The crowd workers surveyed shared a set of nine key values associated with their work-related expectations as they interacted with, and engaged in, CS work on MTurk: access, autonomy, fairness, transparency, communication, security, accountability, making an impact, and dignity (Table 5). How these values were implicated in various work structures within the CS platform varied greatly, however.

Access to CS work is overwhelmingly valued but is multifaceted; it conveys different meanings to workers. It provides a means of income generation for those who are unable to conform to traditional workplace expectations due to certain life circumstances (e.g., stay-at-home parents, individuals with health problems). For those unemployed, CS can be their only job option for making ends meet (i.e., paying bills, buying groceries), creating an important financial cushion. Autonomy emerged as one of the most salient values held by MTurk crowd workers, with them appreciating flexibility and freedom in deciding what tasks to take on, and how, when, and where to perform them. While some enjoyed control over their work schedule, others appreciated the freedom in their choice of tasks. In addition, crowd workers expressed the desire of making an impact, contributing to the community and having a positive impact on others’ lives, such as in performing research-related, survey HITs.

The perception of fairness (or lack thereof) is associated with two important aspects—compensation and governance—of CS work. While most appreciated that they could obtain monetary reward ("The best thing about doing [CS] jobs on [MTurk] is getting paid"), the same individuals felt they were unfairly compensated (i.e., being paid 20 cents for 10 minutes’ work) and sometimes unfairly treated (i.e., job requesters rejecting work without reason). Moreover, some...
### Table 5. Value Categories and Examples

<table>
<thead>
<tr>
<th>Crowd Worker Value</th>
<th>Example</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access:</strong> Open and equal access to work opportunities offered in the CS environment (derived from the study).</td>
<td>[CS] work is providing me money to pay monthly bills and helping me to dig out of the hole I was in from being out of work for so long. [MTurk] helps me to pay bills and buy groceries. It’s necessary until I get another job that pays more. (Female, 45 years; Bachelor’s degree; Household income $25,000–$49,999; Unemployed)</td>
<td>97%</td>
</tr>
<tr>
<td><strong>Autonomy:</strong> Ability to decide, plan, and act in ways that are believed will help in achieving personal goals (Friedman 1996). Having a strong sense of freedom and independence in work choices (Schein 1985).</td>
<td>I enjoy being able to choose what I’ll work on. I’ve chosen assignments based purely on pay … and … because the subject matter was interesting to me or for a good cause. (Female, 45 years; Bachelor’s degree; Household income $25,000–$49,999; Employed full-time)</td>
<td>85%</td>
</tr>
<tr>
<td><strong>Fairness:</strong> The CS work process are unbiased (Modified from Walldius et al. 2005). Freedom from bias; not privileging one person, group, stakeholder over another (Friedman et al. 2006).</td>
<td>It’s important that worker get paid the amount they deserve. I think all requesters should put HITs at a minimum of $6/hr or more. For example, a survey that takes 10 minutes but only pays 20 cents is ridiculous! (Male, 18 years; Some college education; Household income $75,000–$99,999; Unemployed)</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Transparency:</strong> The process by which CS work standards and protocols are certified to be open and understandable (modified from Walldius et al. 2005).</td>
<td>I’d change how requesters are reviewed and rated so that Turkers like myself can avoid bad requesters and do quality work for the ones that are worth it. For example, as of now, we can’t see ratings of [requesters] on the site… so we’re ‘blind’ and can’t know that a requester can potentially reject our content. Having a rating platform (like Turkopticon) benefits everyone working for the site. (Male, 25 years; Bachelor’s degree, Household income $25,000–$49,999; Employed full-time)</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Communication:</strong> The capability to inform others and being informed during CS job processes (derived from the study).</td>
<td>I’d like to see better communication between requesters and workers. Amazon doesn’t get involved in disputes or misunderstandings between workers and requesters. For the most part, the requesters who I have needed to contact have been polite and have made a point to respond to me, which I appreciate. (Female, 28 years; Some college education; Household income $50,000–$74,999; Unemployed)</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Security:</strong> Protecting people’s rights to perform jobs; lack of job security is evidenced by disruption and threat to one’s work environment (modified from Schein 1985).</td>
<td>I’d like MTurk to be more protective of workers—we get scammed a lot. Say you spend 30 minutes filling out a survey, but after you submit your answers, you get no completion code to get paid. They have their data and you get nothing. (Female, 43 years; High school graduate; Household income $75,000–$99,999; Employment-Other: Stay-at-home mom)</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Accountability:</strong> The properties that ensure that the actions of a person, people or institution may be traced uniquely to the person, people or institution (Friedman and Kahn 1992).</td>
<td>Requesters should be held accountable for their shortcomings/unethical behavior because too often they abuse a system that does not care. (Male, 24 years; Bachelor’s degree; Household income $75,000–$99,999; Employed part-time)</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Making an impact:</strong> Work influences other individuals, groups, and communities (Schein 1985).</td>
<td>[Working on academic surveys] gives me a sense of pride knowing that I’m helping the research community by assisting them with data collection … I really enjoy surveys … for Master’s or Doctoral research, because I know that someone working to not only provide new, insightful research … but to also better themselves. (Male, 30 years; Bachelor’s degree; Household income $75,000–$99,999; Employed part-time)</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Dignity:</strong> A sense of pride in oneself and self-respect (modified from Le Dantec and Edwards 2008).</td>
<td>I don’t feel like there’s enough respect for workers. For example, someone might offer $0.50 for an hour’s … work. Requesters can often be ignorant of the ins and outs of MTurk and this can lead to unwarranted rejects. (Male, 34 years; Bachelor’s degree; Household income $50,000–$74,999; Employed full-time)</td>
<td>11%</td>
</tr>
</tbody>
</table>

*Note: Each worker’s statements may have more than one coded value category assigned so the percentages do not sum to 100%.*
crowd workers also perceived unfairness in MTurk’s worker evaluations (i.e., MTurk’s Master Qualification). Transparency is deeply rooted in the openness of CS work standards and protocols. To some extent, the value of transparency is embedded in open source work because each published HIT includes a brief job description, instructions, time requirement, and payment amount. However, sometimes, workers found their interactions with job requesters to be less forthcoming, leaving them feeling “blind” to the work process. They expressed their desire for direct and open communication with job requesters so as to be informed about their job performance and to reduce the risk of potential disputes. Their desire to receive feedback from requesters grows stronger in cases of work rejections because each rejection reduces their chances of attaining Master status. Security entails the provision of assurance, safety, and minimization of work disruptions. Some crowd workers perceived MTurk jobs as secure as they believe that MTurk is unlikely to “go bankrupt.” Nevertheless, lack of job security is a prevalent feeling shared by crowd workers. This is often due to task scamming (i.e., completing work for no payment), which causes disruption in pay and is a potential threat, undermining crowd worker reputations. Crowd workers value accountability, believing that people’s or institutions’ actions should be traced uniquely and should be accounted for. The current design of the MTurk platform rarely holds job requesters accountable for their behavior, as crowd workers encountered job requesters who abused the CS system (e.g., lying about pay rates). The desire for dignity (sense of pride and respect) is also revealed. Whereas some felt that their work was valued and respected by job requesters, others were disappointed in the lack of respect exhibited by job requesters who did not provide an honest worktime estimate or who rejected their completed work unreasonably. For more details on the nine value categories, see Appendix C.

In sum, MTurk mostly fulfills worker values in relation to access, autonomy, and making an impact because the platform offers people from all walks of life free access to work and provides them with control over work decisions, leading to a sense of empowerment. The remaining values were found to be partially, or in some cases, rarely supported, leaving crowd workers feeling exploited. Below we discuss these values and the implications in more detail.

**Empowerment Through Value Fulfillment**

When a subset of the nine values was implicated in the CS work structures, workers expressed empowerment in relation to (1) meaning, (2) self-determination, (3) impact, and (4) competence. These four types of empowerment are summarized in Table 6, followed by a more nuanced account of each structure.

**Empowerment through meaning** is a common experience resulting from the value of access to open work opportunities. Access to microtask CS was personally meaningful to 96 percent of our respondents. Meaningfulness takes on a number of different forms. For some, access to the CS platform was financially meaningful (making extra income); for others it was cognitively meaningful (feeling productive or mentally challenged); for still others it was experientially meaningful (experiencing enjoyment and excitement).

Further, even when meaningfulness took the same form, such as being financially meaningful, the instantiations of meaningfulness that lead to empowerment were often driven by personal circumstances, as noted by two crowd workers (one currently unemployed and the other owning her business):

> It allows me to work from home without wasting time and money driving. Since I’m currently unemployed and looking for a job, this allows me to survive in the meantime. (Female, 50 years; Graduate degree; Household income < $25,000; Unemployed)

> MTurk has become a secondary source of income that allows me to keep going while I’ve been experiencing a downturn in sales. Without MTurk there’s a good chance I might have to abandon my own business and find a “proper” job....it brings in enough money that I can cover my basic living expenses, giving me a little breathing room so I can follow my dream. (Female, 38 years; Some college education; Household income $25,000–$49,999; Employed part-time)

Likewise, the instantiations of cognitive meaningfulness that lead to empowerment were also often driven by personal circumstances. For a 66-year-old retiree, the CS work, coupled with ubiquitous Internet access, allowed her to continue to keep mentally challenged because she needed challenges to keep her mind “in gear.” For a 26-year-old working professional, the nature of a particular CS task (i.e., research HITs) made her “think about the subject matter before responding to the questions asked.”

Feelings of empowerment were also derived from experiential meaningfulness, enjoying the experience of engaging in microtasks:

> I want to be happy. I don’t care anymore about advancement or notoriety or bigger paychecks. I...
Deng et al./Empowerment and Marginalization in Microtask Crowdsourcing

**Table 6. Worker Empowerment and Examples**

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition*</th>
<th>Example</th>
<th>Percent**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning</td>
<td>The job activities are personally meaningful to me.</td>
<td>“I think that one of the best things [about MTurk] is that it gives me something to do that makes me feel productive, instead of wasting time on the internet.”</td>
<td>96%</td>
</tr>
<tr>
<td>Self-</td>
<td>I can decide on my own how to go about doing the work.</td>
<td>“As [an MTurk] worker you can choose what you want to do. If you want to do batches one day and surveys the next, it’s up to you. I also think it’s important … that you can work when you have time, at any hour of the day.”</td>
<td>85%</td>
</tr>
<tr>
<td>determination</td>
<td></td>
<td>“I like that I can contribute to research studies that benefit society. For example, on Saturday I completed a writing HIT that involved describing job opportunities in Florida. I think that helps people … looking for work that guides them to find a better match.”</td>
<td>16%</td>
</tr>
<tr>
<td>Impact</td>
<td>I have a significant influence on others.</td>
<td>“I like that it gives me the opportunity to use some of the skills I learned in college. For example, there’re a handful of jobs that come along that require the ability to do research. I’m quite good at researching and this comes in handy.”</td>
<td>15%</td>
</tr>
<tr>
<td>Competence</td>
<td>I am confident about my skills and capabilities to do the work.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Definition of the four empowerment cognitions are adopted from Thomas and Velthouse (1990).

**Each respondent may have their statements assigned to more than one code so that percentages do not sum to 100%.

worked a six figure job before the cancer and no matter how hard I worked or how much money I made, it never felt fulfilling. (Male, 33 years; Bachelor’s degree; Household income $25,000–$49,999; Employment-Other)

Empowerment through self-determination stems from the value of autonomy in CS work. Crowd workers enjoyed the power of decision-making, such as “having the ability to return HITs.” The free will exerted in work choices is nuanced in terms of what, when, where, and how to work:

I like that I can work anywhere with an Internet connection...I got my hair done last week and the salon has free Wifi. I did a few simple HITs on my iPad while I waited. I also like that tasks are relatively brief. I can start and finish tasks while doing other things. (Female, 25 years; Bachelor’s degree; Household income $50,000–$74,999; Unemployed)

Crowd workers’ sense of autonomy is also augmented by CS task characteristics; for example, the variety of MTurk tasks afforded workers opportunities to create a portfolio of preferences:

There are at any time over 200,000 HITs of many different types available....Since [they] take a short time, I can accept them 24 hours a day at my leisure, I can complete work on my computer anywhere...I have an Internet connection, and many HITs allow me to do creative things like write for blogs, make videos, provide feedback, brainstorm, etc. (Male, 33 years; Bachelor’s degree; Household income $25,000–$49,999; Employment-Other: Disabled)

Empowerment through impact, arising from the value of making an impact on others and on society in general, affords a sense of contributing something for the greater good:

I enjoy being part of a larger purpose and like helping with audio and psychological research. There’re jobs that help make computer speech better for blind people and I feel a sense of accomplishment and community when I work on things like that. (Male, 42 years; Bachelor’s degree; Household income $25,000–$49,999; Employed part-time)

While empowerment through impact was valued by only a small proportion (16%) of our sample, we argue that its presence could potentially strengthen the overall sense of empowerment, as illustrated by the following:

I also enjoy doing academic surveys because I learn a lot from them and I’m helping other people with their research....It makes me feel useful when I’m helping others. (Female, 33 years; Bachelor’s degree; Household income $100,000 or more; Employed part-time)

In addition, the feeling of making an impact can also play a moderating role by attenuating the effects of marginalization. Despite feeling competently marginalized, crowd workers
continued to do CS work because they feel good about making an impact:

75% of [HITs] are mindless, meaningless, repetitive work that robots will eventually be able to do. The academic surveys are the one area where I feel like I’m contributing to a greater good, so those satisfy me. (Female, 41 years; Graduate degree; Household income $25,000–$49,000; Employed full-time)

**Empowerment through competence**, ensuing from the value of access to diverse kinds of micro tasks, is valued by a small proportion (15%) of the crowd workers in our sample but is valued nonetheless:

It’s made me more proficient on a computer and has definitely kept my mind active and alert. So...I believe it helps. It also gives me something to fill the gap in my resume from being unemployed. (Female, 50 years; Graduate degree; Household income < $25,000; Unemployed)

Given that micro tasks are often relatively mindless and repetitive, reported instances of empowerment through competence may be expected to be smaller. However, their presence, along with the other, more dominant empowerment cognitions of meaning and self-determination, could potentially strengthen the overall sense of empowerment:

[CS] is improving my analytical skills and perceptions. It’s making me aware of political issues and [being more] self-aware. It’s helping me become more articulate and providing real emotional and financial satisfaction. (Female, 44 years; Bachelor’s degree; Household income $25,000–$49,000; Employment-Other)

In sum, our study shows that the four cognitions identified in the extant literature (i.e., Spreitzer 1995) combine to reflect crowd workers’ experiences of empowerment. Moreover, empowerment was experienced by all groups across our sample. To illustrate the point, Table D1 in Appendix D summarizes the distribution of empowerment by two demographic factors (employment status and educational level attained). Moreover, our analysis shows that the associations between values and the four cognitions of empowerment vary (Table D2 in Appendix D). For example, all of the workers who valued autonomy felt empowered via self-determination. Although two cognitions (meaning and self-determination) appear more pronounced, we argue that the other two (competence and impact) are important in acting as buffers that mitigate workers’ feelings of marginalization, a topic to which we now turn.

### Marginalization Due to Unfulfilled Values

Crowd workers felt marginalized when some of their key values were not supported by the CS platform. The resultant conditions led to a sense of collective powerlessness. Specifically, marginalization manifested in (1) economic marginalization, (2) institutional (policy) marginalization, (3) institutional (technical) marginalization, and (4) competence marginalization. Table 7 summarizes these forms of marginalization. Unlike empowerment, there is not always a clear one-to-one mapping between a dimension of marginalization and a particular value. Overall, crowd workers felt marginalized when they could not exert their personal agencies to attain the values of fairness, dignity, security, communications, accountability, and transparency.

We found that the most prevalent types of marginalization emerged primarily as a result of economic (60%) and institutional policy and practice (38%) concerns that fostered conditions for perceived exploitation. How values are implicated (or not) in the CS platform determines the degree of marginalization experienced. Below, we provide a more nuanced account of the marginalization being experienced by organizing the discussion around the four types of marginalization when fairness, dignity, security, communication, accountability, and transparency failed to be adequately supported.

**Economic marginalization** refers to a feeling of being exploited as a result of perceived inequities in MTurk’s compensation structure. As noted, MTurk recommends a compensation rate of $0.10 per minute. In their responses, crowd workers emphasized that pay rates offered by some job requesters are unfairly low, with some of them not even reaching the recommended minimum:

It’s unfair and inhumane to pay people an average of $2 per hour. I make more than that sometimes, but overall the pay is far too low, and I feel it’s exploitative of people who are desperate to make money. (Female, 41 years; Graduate degree; Household income $25,000–$49,999; Employed full-time)

Moreover, crowd workers also raised concerns with regard to job requesters not taking into consideration the nature (complexity) of tasks when setting pay rates. For example, writing HITs may require more time and effort than other categories (e.g., tagging HITs). The recommended pay rate across all types of HIT discourages crowd workers who would otherwise be interested in such tasks:

The pay rate is terrible for many jobs, especially writing jobs, and it would be nice to see that change.
Table 7. Worker Marginalization and Examples

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Example</th>
<th>Percent**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worker Marginalization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic marginalization</td>
<td>Feeling exploited</td>
<td>The pay can be really atrocious, akin to sweatshop wages. It would be nice if everything had a fair wage. (Female, 34 years; Some college education; Household income $25,000–$49,999; Employment-Other: Stay-at-home Mom)</td>
<td>60%</td>
</tr>
<tr>
<td>Institutional (policy) marginalization</td>
<td>Feeling helpless in relation to job requesters and the CS platform</td>
<td>Stop all scammers who put up HITs and don’t pay. We have no recourse at all because what the requester says is final. There’re many requesters who put up HITs who never intend to pay ... If there was a way to stop the scammers, it would make [M]Turk a much safer and more fun place to work. (Male, 49 years; Some college education; Household income &lt; $25,000; Unemployed)</td>
<td>38%</td>
</tr>
<tr>
<td>Institutional (technology) marginalization</td>
<td>Feeling constrained by the technical functionalities of the platform</td>
<td>Make a reliable, uniform, automatic system of keeping track of whether I’ve already participated in a task that doesn’t allow retakes. Keeping track of the tasks I’ve already done is burdensome especially when requesters change the names of their reposted HITs. (Male, 34 years; Bachelor’s degree; Household income $50,000–$74,999; Employed full-time)</td>
<td>23%</td>
</tr>
<tr>
<td>Competence marginalization</td>
<td>Feeling deskill from doing simple and repetitious work</td>
<td>Sometimes I feel like that I am doing the same types of tasks, or even the same exact task, over and over again. (Male, 19 years; High school graduate; Household income $75,000–$99,999; Employment other)</td>
<td>18%</td>
</tr>
</tbody>
</table>

*The definitions of the four marginalization dimensions are derived from the study.

**Each respondent may have their statements assigned to more than one code so that percentages do not sum to 100%.

I’m a writer by trade, and freelance in other areas of MTurk, but I rarely take content jobs here because the pay is insultingly low. (Female, 38 years; Some college education; Household income $25,000–$49,999; Employed part-time)

**Institutional (policy) marginalization** refers to a feeling of helplessness arising from MTurk’s governance structure, where policies and procedures are perceived to disproportionately favor job requesters. We noted that crowd workers were often on the lookout for MTurk policies and guidelines that would ensure successful transactions with job requesters. As they reflected on their experiences, they voiced how the policies and procedures (or lack thereof) implemented by MTurk engendered feelings of helplessness and powerlessness. Two frequently cited policies relate to the Master qualification and payment rejections.

MTurk confers Master status, following evaluation of workers’ performance, to those who perform well. MTurk defines Master workers as

elite groups of Workers who have demonstrated accuracy on specific types of HITs….Workers achieve a Masters distinction by consistently completing HITs of a certain type with a high degree of accuracy across a variety of Requesters” (https://requester.mturk.com/help/faq).

Crowd workers seek Master status because it allows them access to better paid HITs. However, certain groups of workers—those who perform content HITs (e.g., writing and survey work)—found themselves being excluded:

I’d also like to see the master’s program become available to more people because...it seems like it’s mainly available to people who do categorization or photo moderation tasks...a lot of requesters for surveys don’t realize this and require a Master’s qualification. It leaves people like me out. (Female, 30 years; Bachelor’s degree; Household income $25,000–$49,999; Employed part-time)

Further, crowd workers feel powerless when their work is rejected; they do not understand requesters’ reasons for rejection but have no way to appeal because “what the requester says is final.” This sense of helplessness is due to two reasons. First, there are no direct channels of communication with job requesters to clarify rejections, and in some cases, job requesters are scammers who plan to take completed work without payment. Second, there exists an asymmetry in the reputation of workers and requesters: workers’
reputations are determined by their acceptance rate—a
fundamental feature of MTurk. Large proportions of rejected
work damage worker reputations and lower their chances of
future work. By contrast, there is no systematic reputation
mechanism for requesters. Requesters can refuse to pay for
any or all work done without reason. There is no appeal pro-
cess, and crowd workers have called on MTurk to intervene
by implementing policies to keep job requesters accountable
and honest.

Institutional (technology) marginalization is a feeling of
exclusion when the platform features prevent crowd workers
from fully participating. As much as they appreciate the
open, convenient access to MTurk, crowd workers point to
the inadequacy of some platform features. For example, some
find the current technology structure insufficient in (1) facil-
itating their communications with job requesters, (2) keeping
track of their work history, and (3) protecting them from bad
requesters and scammers. When workers wish to clarify a
HIT requirement or seek answers to HIT rejections, they find
MTurk’s technical features lacking:

I’d also like if requestors made it easier to commu-
nicate with them. Sometimes I have a question and
and a requestor doesn't bother to respond. Sometimes
I’ve had to return surveys I’ve spent a lot of time
on...or there has been an error in the study and I’m
unsure what to do next. I wish the time could be
longer sometimes also. I’ve had HIT's expire on me
even when working at a good pace. (Female, 33
years; Bachelor’s degree; Household income
$100,000 or more; Employed part-time)

Crowd workers also find it difficult to keep track of HITs they
perform. This is unsurprising as, on average, those surveyed
complete almost a thousand (958, to be precise) HITs each
week. Survey respondents noted that the current MTurk plat-
form does not help them account for work performed. To
make matters worse, if the same HITs are repeated uninten-
tionally, they will receive a rejection, negatively affecting
their work statistics:

The biggest problem I have...is the inability to find
out quickly and easily if I’ve done the HIT pre-
viously! Out of the 20 rejections that I have...I’d
say 17 of them are for attempting to do a HIT that
I’d previously done!...this is an honest mistake... but
it still counts against our average; [MTurk] need[s]
to come up with something on the dashboard that
will allow us to quickly check past work. (Male, 45
years; Associate degree; Household income
$25,000–$49,999; Employed full-time)

Further, some workers complain that the current system offers
only limited tools/mechanisms to allow them to scan, filter, or
block bad requesters and scammers. The increasing presence
of scammers gives rise to workers’ feelings of vulnerability:

I dislike the lack of resources for workers to com-
plain about scammers who repeatedly post HITs
trying to dupe people into disclosing financial infor-
mation, click advertisements, or sign up for credit
cards. If there was a better way to report and block
those types of jobs, I think it would be great. (Male,
30 years; Bachelor’s degree; Household income
$75,000–$99,999; Employed part-time)

However, oftentimes the implementation of technical features
is closely related to MTurk’s governance structure. For
example, with regard to the implementation of clearer and
stricter rules on rejecting a completed HIT, some workers
urge MTurk to allow job requesters more options for HIT
rejection, proposing technical functionality to distinguish
between declining and rejecting completed work: a decline
decision would not jeopardize a worker’s standing while a
reject decision would:

I’d like to see a system set up that would allow a
requester to decide not to accept work without
actually rejecting the worker. If you do a writing
task...in good faith...you should not end up with a
rejection on your permanent record that affects your
ability to work....[R]andom rejections discourage
many people from even attempting these HITs.
Amazon should probably make more effort to
penalize or ban requesters [who] steal writing by
publishing work they rejected. (Female, 38 years;
Some college education; Household income
$25,000–$49,999; Employed part-time)

Competence marginalization refers to becoming deskilled as
a result of doing simple, repetitive work on MTurk. Given
the preponderance of simple, mundane tasks, some workers
called for greater variety:

I’d like to see more [computer coding] HITs. I’m a
programmer and would love to put my skills to
work...Most of [the] HITs pay so little it’s hardly
worth doing them. Doing a lot of HITs does in-
crease your [income], so that’s what’s driving me to
do [these] garbage HITs. (Male, 31years; Some
college education; Household income < $25,000;
Unemployed)

Similar to empowerment, marginalization was experienced by
all groups in our sample. Table E1 in Appendix E sum-
The duality is intrinsic to the lived experiences of the crowd workers. The duality of microtask CS is reflected in two contrasting yet coexisting feelings of empowerment and marginalization experienced simultaneously by the same crowd workers. These dual experiences surface when crowd workers interact with CS work structures that mediate their activities. The four structures of microtask CS are compensation, task, governance, and technology (as detailed in the “Microtask Crowdsourcing” section of this paper). As a medium of crowd workers’ conduct of work, these structures have both empowering and marginalizing implications on crowd worker activities. They feel empowered when the structures enable choice (e.g., where and when to work satisfying the value of autonomy); they feel marginalized when the same structures restrict action (e.g., lack of communication channels limiting their opportunities to voice concerns). In effect, the dual experiences are collectively determined by the extent to which the nine values are undermined or promoted in the design of these four work structures, as illustrated in Figure 1.

The four microtask CS structures at times individually and sometimes collectively conspire to engender opposite feelings of empowerment and marginalization which are unequal and nonuniform. The structures of compensation and governance evoke stronger feelings of marginalization while the task and technology structures are largely responsible for engendering the feeling of empowerment. For instance, on one hand, the feeling of marginalization is deeply rooted in the current microtask compensation structure where the extremely low payment rate results in feeling being exploited. On the other hand, the empowerment derived from free, open, and equal access to earn a supplemental or regular income is quickly and easily provisioned through this very structure. Similarly, the governance structure is perceived to favor requestors because they can control task rate and payment rejection without explanation while the crowd workers have no bargaining power except the “take-it or leave-it” option, leaving them with a feeling of helplessness. Conversely, this take-it or leave-it option provisions popular work pattern flexibility where workers can finish the tasks they want to and return those they no longer wish to complete. Nonetheless, our analysis suggests that the governance structures are currently designed mostly to reinforce traditional regimes of managerial power and control (Kraemer and Dutton 1979; Markus 2014; Pinsonneault and Kraemer 1997) over the workforce, possibly a conscious effort by MTurk to mitigate requestors’ risks as they are the source of MTurk’s revenues. Meanwhile, the CS platform owners who provision the technology structure assume the role of dispassionate technology supplier of a free, open marketplace where there are no barriers to “becoming” a worker, but simultaneously fail to provide adequate technological tools and functions to meet workers’ communication and microtask management needs. Similarly, the impersonal

The Duality of Microtask Crowdsourcing: Structures of Empowerment and Marginalization

The duality experienced by the majority of those surveyed is distributed relatively evenly across the demographic factors of gender, education level, employment status, and household income (Appendix F). IS literature recognizes the dual outcomes of ICT (see Markus 2014). The paradoxical nature of ICT, where it simultaneously produces opposite effects, has been found in a wide range of contexts, such as organizational structures (ibid.), individual users (Jarvenpaa and Lang 2005), and communities (Harris and Weiner 1998). There is thus a need to account for the contradictory consequences of ICT (Markus 2014; Robey and Boudreau 1999). The duality of microtask crowdsourcing accounts for such contradictions by highlighting that, while the use of Internet technologies to create new work structures that are largely adhocratic and less bureaucratic can provide workers with a sense of control and freedom that is empowering, current work structures that are baked into the CS infrastructure privilege requestors in ways that undermine crowd workers’ sense of empowerment.

Among the 210 workers surveyed, 70% (147 workers) simultaneously experienced at least one form of empowerment and one form of marginalization. The duality experienced by the majority of those surveyed is distributed relatively evenly across the demographic factors of gender, education level, employment status, and household income (Appendix F).
programmed coordination (Finnegan and Longaigh 2002; Markus 2014) implicated in the microtask structures provision the design of repetitive and routinized tasks that allow for work pattern flexibility, but simultaneously discourage workers from continuing to engage in deskilled tasks because they are dehumanizing and lack opportunities for skill development.

Duality is a critical property of this phenomenon. By uncovering the presence of duality, we create a space for examining and interpreting opposing feelings of empowerment and marginalization that are simultaneously voiced by the same crowd workers. The emergence of such a space pushes the CS discourse from the silos, where it is either primarily touted as the wellsprings of entrepreneurial creativity (e.g., Greengard 2011; Kaganer et al. 2013) or mostly portrayed as the harbinger of digital sweatshops (e.g., Harris 2011; Marvit 2014), to a more dialogic discourse where these two views are not mutually exclusive but rather mutually constitutive (Schultze and Stabell 2004).

Our analysis of the duality suggests that, in order to reap the benefits of microtask CS, such intricacies as those associated with the underlying structures of empowerment and marginalization should be well understood and carefully considered in designing CS platforms and policies. In addition to providing confirmatory evidence in support of contradictory consequences of ICT, the current study makes a number of novel and important contributions to and for IS research, as well as raising some crucial ethical issues.

Contributions to and for IS Research

To begin with the contributions to IS research, our study contributes to both CS and VSD research. Three contributions are made in relation to CS research. First, and on the positive side, by identifying the sources of crowd worker empowerment, our research reveals those critical technological features that support microtask CS and that drive worker engagement. Strong feelings of empowerment arise from open access to job opportunities and work pattern autonomy. We argue that human values of open access to jobs and work pattern autonomy provisioned by CS technologies transcend all types of work and could help empower workers in other forms of CS, but only if issues of marginalization are confronted and ameliorated.
Thus, second, and much more negatively, by exposing sources of worker marginalization rooted in the conduct of microtask CS, our study reveals strong feelings of worker marginalization arising from incongruities between worker values of fairness and the lack of fair compensation and governance practices. Worker marginalization could not only jeopardize the future of CS but also raise crucial ethical concerns that we argue simply must be addressed. Current practices ostracize workers who could otherwise benefit from CS work. Prior studies view CS as a model where organizations use Internet technologies to harness the efforts of crowd workers to perform organizational tasks (e.g., Brabham 2012; Saxton et al. 2013). However, what is missing here and in the microtask CS marketplace is appropriate governance of the sourcing contract (e.g., contract negotiation, monitoring, delivery, and closing) and a collective bargaining unit for crowd workers. In our study, crowd workers voiced frustration over extremely low pay, increased scamming, and lack of channels to report and appeal unfair practices, signaling an unregulated online labor marketplace. Prior studies (e.g., Brabham 2012; Kittur et al. 2013; Silberman et al. 2010; Williamson 2014) have raised concerns about the lack of ethical standards in microtask CS. Our study provides further insight into this lack by revealing four types of worker marginalization and uncovering their sources, which are deeply rooted in current microtask CS structures. We shall return to this issue below and in our concluding remarks and reflections.

Third, our inductive findings can be used to explain the interplay among the human values, cognitions of empowerment, and dimensions of marginalization, thus laying a foundation for future deductive work. Our study reveals a comprehensive list of nine values important to crowd workers in undertaking microtask CS. In particular, a majority of those workers who value accountability, communication, security, and transparency felt that microtask CS allowed them to exert control and to become self-determined, leading to a sense of empowerment. However, the same group of workers expressed feelings of being taken advantage of by the lack of appropriate governance mechanisms, leading to a simultaneous sense of marginalization—the duality to which we refer. Future studies can investigate the (strength of) the relationship between worker values and the CS experience (empowerment vis-à-vis marginalization) by examining the degree to which worker values are implicated in microtask and other CS structures. Such studies could uncover the relative importance of various values, which could be useful in understanding how crowd workers make tradeoffs to resolve conflicting values and which could inform improvements to current CS-related practices and policies. An associated avenue for future CS research is to focus on the microtask structure (i.e., increasing task significance via task structure can empower workers through meaning and impact).

While our study confirms the positive role of Internet technologies in affording open access and individual freedom to crowd workers, it also reveals that deficiencies embedded in the technology structure of CS platforms lead to worker marginalization. Future studies could test the relationship between worker values (e.g., communication, transparency, accountability) and the underlying CS structures (e.g., governance, technology). Insights from such studies could not only help address the criticism that “[t]hese technologies are not enabling people to meet their potential; they’re instead exploiting people” (Cherry, cited in Marvit 2014) but could—and should—also have far reaching consequences for job requesters and platform providers, as well as for the IS research community itself.

With respect to VSD research, our study contributes in two ways. First, it contributes by empirically identifying an additional set of values within the CS context. Our approach to the study of crowd worker values is consistent with calls by VSD researchers (e.g., Le Dantec et al. 2009) who recommend moving away from largely fixed value classifications to a more flexible value repository that accounts for context. Our study reveals positive values (autonomy, dignity, fairness, security, transparency, and accountability), which are consistent with Friedman and Kahn’s (2003) perspective of the universality of human values, as well as such values specific to the CS context (i.e., access; communication, making an impact). Additionally, we uncover aspects of CS that fly in the face of ethical design. We, thus, extend previous research by identifying a novel set of human values implicated in the CS context, recognizing that different patterns of values might emerge from different contexts. These CS-centric values with moral epistemic standing should serve to ethically ground the design and development of CS platforms. Our study thus posits an initial repository of human values with ethical import for CS platform design. This repository can be used as a foundation for classifying values that can be extended by future design science researchers through an iterative and integrative process defined in VSD’s tripartite investigations involving conceptual, empirical, and technical analysis. Second, we broaden VSD’s reach by applying it in a more complex social–technical system (STS) than is usual in VSD studies, which focus primarily on the use of micro computational systems such as Web browsers, groupware, simulation system, and RFID (e.g., Friedman et al. 2008; Millett et al. 2001). Extending the application of VSD to the CS context is challenging because VSD prescriptions are not necessarily readily applicable. However, the approach used in this study offers an initial illustration of how VSD may be used to conduct the empirical portion of VSD’s tripartite investigations.
Our study also has profound implications for IS researchers and other communities that undertake research utilizing CS platforms (e.g., to gather and/or analyze data). Picking up on themes raised by, *inter alia*, Desouza and his colleagues (2007; 2006), we argue that we as a community of IS scholars simply cannot stand by and accept the marginalization and exploitation of crowd workers. As well as arguing for ethical design in CS systems (work processes as well as technological platforms), we argue for ethical design of our own research practices, for example, in relation to providing appropriate compensation to crowd workers for their contributions to research studies, and in advocating for appropriate research policies on the part of our universities. We return to this theme in our concluding remarks.

Implications for Design Science Researchers

The design science paradigm is gaining popularity within IS research internationally (Hevner et al. 2004). VSD provides a comprehensive framework for advancing a value-centered research and design agenda, which is different from user-centered design perspectives (Le Dantec et al. 2009). VSD scholars distinguish between usability and human values with ethical import by arguing that usability refers to system properties that make it work in a functional sense; however, in this sense, usability does not guarantee the support for ethical values (Friedman et al. 2008). The VSD approach can prove useful in bridging the gap between efficient design of sociotechnical systems (STS) and ethics by prioritizing consideration of human values with ethical import in design. To this end, the implications of this work for design science researchers are twofold.

First, the approach adopted in this study provides an ethical design perspective that can be used in future research to analyze societal problems entangled in STS. Such an approach can be useful in eliciting values through a harm and benefits analysis (Friedman et al. 2008) during requirements gathering. The derived values can be used to conduct value-sensitive analysis to evaluate the consequences of implicating—or not implicating—the values in new systems. Incorporating a value sensitivity component in requirements gathering to infuse features that embody human values of ethical import could help in mitigating system failures (Friedman et al. 2006).

Second, we offer an agenda for future design science research that could help advance ethical considerations in the design of microtask CS work systems by being mindful of how crowd workers’ values are implicated in CS structures to produce dual effects. Design investigations that are sensitive to crowd worker values are more likely to produce designs that provision worker empowerment while reducing worker marginalization. This in turn could foster a motivating environment where crowd workers feel appreciated rather than resentful. We posit that a more appreciative workforce is likely to be more productive and less likely to collectively protest against the interests of job creators. A greater balance of power provides fewer possibilities for abuse, allowing microtask CS to develop into a more open and free job marketplace, a principle germane to the sustainability of this kind of CS. Specifically, we propose two kinds of analysis that can be conducted to further this work. One is value-driven investigation on microtask CS platforms where a more detailed and nuanced tripartite analysis is done on each value (see Table G1 in Appendix G); the other is a similar, structure-driven analysis that focuses on the four structures where the values are implicated (see Table G2 in Appendix G).

Implications for Practitioners

Our analysis suggests that understanding the salient values is instrumental in affecting crowd workers’ sense of empowerment and/or marginalization. In this regard, our study offers several useful guidelines to the three key practitioner stakeholders in microtask CS: crowd workers, job requesters, and platform designers and owners.

Guidelines for Crowd Workers

We argue that crowd workers should collectively mobilize to ensure that their voices are heard and not drowned out when the drumbeat for regulating the on-demand workforce grows louder (O’Donovan 2015). Crowd workers can collectively voice their concerns to affect change by participating in such forums as DYNAMO (http://www.wearedynamo.org/), Turkopticon (https://turkopticon.ucsd.edu/), and MTurk Forum (http://mturkforum.com/). They are not obliged to ensure that their voices are heard and not drowned out when the drumbeat for regulating the on-demand workforce grows louder (O’Donovan 2015). Crowd workers can collectively voice their concerns to affect change by participating in such forums as DYNAMO (http://www.wearedynamo.org/), Turkopticon (https://turkopticon.ucsd.edu/), and MTurk Forum (http://mturkforum.com/). They are not obliged to accept marginalization just because some aspects of microtask CS empower them. The dual experiences of marginalization and empowerment are not mutually exclusive and can coexist; thus, one can express discontent with one (e.g., voice concerns over unfair payment practices) without the fear of losing the other (e.g., open access to work on the MTurk platform).

10In relation, for example to IRB policies (see http://wiki.wearedynamo.org/index.php/Guidelines_for_Academic_Requestsers).

11See, for example, Stein et al. (2014) for evidence of the growth of design science research in the European IS academy.
Where walking away from this work (when one feels they are being exploited) is not an option, then workers are being marginalized and have the right to voice their concerns.

**Guidelines for Job Requesters**

The crowd workers in our sample would be considerably more motivated were job requesters to carefully evaluate their rates of payment and alternative microtask designs. Our analysis suggests that crowd workers appreciate CS jobs that allow them to make contributions to scientific research and societal initiatives. However, they feel strongly about being exploited because of ambiguous task instructions and unfair compensation. A requirement for job requesters, would be to provide clearer task instructions and more accurate estimates of time requirements to allow crowd workers to make informed decisions in accepting jobs. Additionally, our data suggest that job requesters should make an effort to maintain open communication with crowd workers, providing them with feedback on work undertaken so that they feel more appreciated. Again, this could usefully be incorporated into CS policies to facilitate more ethical practices.

As for academic researchers, it is clear that CS platforms such as MTurk have been increasingly used by researchers (job requesters) from different disciplines for field experiments (e.g., Alonso and Mizzaro 2012; Chandler and Kapelner 2013; Mason and Suri 2012). As IS researchers, we should be keenly aware of the ethical considerations of employing microtask CS methods in our own research by being mindful of the value of crowd worker; for example, by applying an appropriate rate of compensation without hiding behind the guise of poor research financial support available at many academic institutions, by keeping communication channels open, and by explaining how the crowd workers are making an impact by participating in a research study, as we have (somewhat belatedly, we have to admit) attempted to do in this study. Academic researchers have to ask themselves: Is their scientific inquiry worth investigation if it is done on the backs of crowd workers who are reluctantly accepting low paying HITs because they have no other opportunities for employment?

**Guidelines for CS Platform Designers and Owners**

Designers and owners of microtask CS platforms are advised to listen to crowd workers with a view to improving platform design and updating technical functionalities. CS workers appreciate access to job opportunities, the freedom to make their own job decisions, and the opportunity to integrate work and family obligations. However, they express dissatisfaction with inappropriately low levels of compensation for their work, the limited communication mechanisms, vague standards and policies, and the lack of intervention by platform owners in penalizing fraudulent job requesters. We thus argue that CS platform owners should introduce policies and practices that require job requesters to recompense crowd workers at rates that are appropriate no matter where in the world the worker is located. Platform owners should take their responsibilities seriously and no longer tolerate inappropriate payment or fraudulent behavior on the part of job requesters. Specifically, we strongly recommend that Amazon implement the following design and policy changes to their MTurk platform:

1. **Set fair minimum payment rate**: Set a minimum hourly rate for all MTurk workers that is fair. MTurk has a minimum commission rate that they take from the requestors; similarly, they can devise a minimum hourly rate that would mitigate unfair payment practices. We suggest that Amazon consider crowd workers’ slack time between two tasks and set a rate to offset the time lost between tasks.

2. **Stop the scams**: Protect crowd workers by taking action against the requestors who engage in fraudulent and harmful activities. Have clear policies regarding what is considered scamming and what are the consequences of engaging in such scamming activities. Create a formal governance structure that can be used to identify and punish the scammers. In addition to investigating workers’ scam complaints, allow them to block the requestors.

3. **Make Master level qualification objective and transparent**: The experience of the crowd workers who participated in our study suggests that attaining master level qualification is at best difficult to understand and at worst awarded on MTurk’s whim. MTurk should conscientiously adhere to the policy they have posted on their platform regarding the qualifications required for attaining the master level designation. In addition, MTurk should design platform functionalities that would allow workers to track their progress toward master level; the pathway to master level should not be obscure nor ad hoc.

4. **Establish channels for open communication**: Here we make three recommendations. First, implement a formal mediation process that is run by MTurk through which...
The duality of empowerment and marginalization in microtask CS and calls for more attention to be paid to the risks emerging from the disparities of power in impacts of microtask CS. Our study raises serious concerns about the institutional practices and societal expectations that should be expected by society. To achieve a healthier economy on its workers is taking center stage (e.g., Shaban 2015). We hope that our study contributes to this debate by highlighting that CS enables human beings to achieve autonomy and independence but it does not serve as a panacea for promoting all human values expressed by the crowd nor that should be expected by society. To achieve a healthier and more sustainable CS work environment, we need to pay greater attention to the institutional practices and societal impacts of microtask CS. Our study raises serious concerns about the risks emerging from the disparities of power in microtask CS and calls for more attention to be paid to mitigate worker marginalization. The duality of empowerment and marginalization has implications for participants in the MTurk marketplace and could well be applied in other microtask CS contexts (e.g., MobileWorks; Crowdflower; CloudFactory). Our study relies on data collected via the MTurk platform and has given voice to the crowd workers; future research could usefully consider their work in situ, giving greater emphasis to observations of actual practices (e.g., Whittington 2014). Moreover, our study is restricted to MTurk workers based in the United States to reduce any confounding factors arising from different countries and economies. Further research on international comparisons of microtask CS will enhance our understanding across cultures and national boundaries.

We ourselves have learned much from our study. We commenced our study with certain assumptions about the nature of the CS workforce (e.g., in terms of supplemental income and reasonable compensation levels), only to find that these assumptions were naïve at best. We found that many crowd workers are totally dependent on income arising from their microtask CS work, and our own research design inadvertently lead to inadequate recompense for the detailed responses we received from those who contributed to the study. We have subsequently provided a bonus to the crowd workers and raised the payment rate to the equivalent of a $15 hourly wage. This is similar to the approach adopted by Williamson (2014) in retroactively raising the payment to her MTurk survey respondents.

Limitations notwithstanding, our study presents a deep analysis of crowd worker values in what is an increasingly prevalent social phenomenon. While studies on CS platforms, technical systems, and job requesters are informative, our understanding of CS cannot be complete without an understanding of the crowd itself. CS is only possible with the active enrollment of individual workers. This article offers initial steps in depicting the duality manifested in the technology-enabled marketplace that is CS. Clearly, this particular ICT has the potential to augment the voice of the less powerful—the crowd workers—through interactive communication channels and efficient job filtering. However, by no means all the values that have been voiced can be sufficiently afforded by technology alone. Crowd workers’ reasonable desires for fair compensation and just procedures can only be met by implementing governance policies on compensation and labor relations. A comprehensive understanding of the microtask CS phenomenon will benefit from a multidisciplinary approach that goes beyond ICT (von Krogh and Spaeth 2007). More research is clearly needed to develop technological solutions and governance mechanisms that facilitate improved CS employer–employee communication and to ensure fairness and transparency if we are to take up challenges by the likes of Mumford (1981) and Desouza and his colleagues (2007; 2006).
In the long term, assessing societal impacts of Internet-based technologies and the growing crowd worker population are emerging as active and fruitful areas for researchers and policy makers alike. By seeking to understand the values revealed by crowd workers, we trust that this study will heighten awareness of worker marginalization and lay a foundation for developing and implementing CS platforms and governance mechanisms that empower the crowd workforce, with a view to creating an equitable and rewarding work environment. As a research community, we have a responsibility not only to uncover what is ethical but also to act on our findings. Depending on how well values sensitive to crowd workers are implicated in CS technical platforms and practices could determine whether this increasingly prevalent form of work is a harbinger of worker emancipation or exploitation.

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References


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