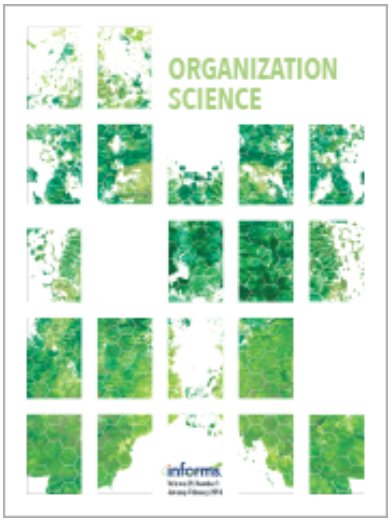

Organization Science

Publication details, including instructions for authors and subscription information:
http://pubsonline.informs.org

How Managers Maintain Control Through Collaborative Repair: Evidence from Platform-Mediated "Gigs"

Hatim A. Rahman, Melissa A. Valentine

To cite this article:
Hatim A. Rahman, Melissa A. Valentine (2021) How Managers Maintain Control Through Collaborative Repair: Evidence from Platform-Mediated "Gigs". Organization Science

Published online in Articles in Advance 19 Feb 2021

. https://doi.org/10.1287/orsc.2021.1428

http://pubsonline.informs.org/journal/orsc

ORGANIZATION SCIENCE
Articles in Advance, pp. 1–27
ISSN 1047-7039 (print), ISSN 1526-5455 (online)

How Managers Maintain Control Through Collaborative Repair: Evidence from Platform-Mediated "Gigs"

Hatim A. Rahman,[a] Melissa A. Valentine[b]

[a] Kellogg School of Management, Northwestern University, Evanston, Illinois 60208; [b] Management Science and Engineering, Stanford University, Stanford, California 94305

Contact: hatim.rahman@kellogg.northwestern.edu, https://orcid.org/0000-0002-5592-8143 (HAR); mav@stanford.edu, https://orcid.org/0000-0001-7517-4054 (MAV)

Received: June 11, 2019
Revised: February 24, 2020; August 14, 2020
Accepted: October 16, 2020
Published Online in Articles in Advance: February 19, 2021

https://doi.org/10.1287/orsc.2021.1428

Abstract. This paper develops a new understanding about how "client managers"—those using platform labor markets to hire and manage workers—attempt to maintain control when managing skilled contractors. We conducted an inductive field study analyzing interactions between client managers and contractors in software development "gigs" mediated by a platform labor market. The platform provided multiple tools client managers could use for control, including in response to unexpected events. We found that, when managers used the tools to exert coercive control over contractors acting unexpectedly, it backfired and contributed to uncompleted project outcomes. In contrast, when they refrained from using the tools for coercive control in such circumstances and instead engaged in what we call *collaborative repair*, their actions contributed to completed project outcomes. Collaborative repair refers to interactions that surface misaligned interpretations of a situation and help parties negotiate new, reciprocal expectations that restore trust and willingness to continue an exchange. Client managers' attempts at collaborative repair yielded fuller understanding of project-related breakdowns and shared investment in new expectations, facilitating effective control and completed projects. This study extends prior theories of control by characterizing the new client manager role created by platforms and demonstrating how initiating repair is integral for managers' capacity to accomplish control in these comparatively brittle work relationships.

Funding: The authors are grateful for the financial support provided by Stanford's Management Science and Engineering program.
Supplemental Material: The online appendix is available at https://doi.org/10.1287/orsc.2021.1428.

Keywords: control • collaborative repair • platforms • platform labor • on-demand gig work

Introduction

The role of a "manager" in our society is changing quickly (Lee et al. 2015, Barley et al. 2017). Previously, most managers acted as "agents" of the organizations employing them, meaning they were accountable to the organization for workers' outputs (Bendix 1956, Chandler 2002, Edwards 1978). Thus, both managers and workers tended to be employees of the same organization. Such employee managers' main responsibilities have been to supervise, control, and facilitate workers' efforts to achieve organizational goals (Sitkin et al. 2010, Cardinal et al. 2017). Because employee managers are held accountable mainly for other people's work, they occupy and navigate a complicated relational structure between their superiors and the workers they supervise in a shared organizational setting (Likert 1961, DiMaggio 2001). Researchers have used a lens of "managerial control" to explore how employee managers attempt and effect control over workers' activities within this role structure and related consequences (Barley and Kunda 1992, Thompson and van den Broek 2010, Gill 2019).

Prior research characterizes employee managers' attempts at control as involving personal interactions with workers, but it also demonstrates that those personal interactions play out in the context of the organization's established bureaucratic and sociotechnical systems (Edwards 1978, Burawoy 1979, Cardinal et al. 2017). As such, the organizational context already encodes the set of behaviors that both managers and workers understand as available, expected, and accepted as managers engage in personal interactions focused on directing, motivating, evaluating, and disciplining workers (Batt and Valcour 2003, Alvesson and Kärreman 2004, Michel 2011, Gibbons and Henderson 2012). When workers or managers deviate from normative expected behaviors, they do so as organizational members who have common colleagues, shared understanding, and codified bureaucratic systems for dispute resolution (e.g., Dougherty 1992, Bechky 2003, Kellogg 2009).

Organizational executives, as the final authorities in any dispute resolution, have some vested interest in the work and relationships among managers and workers, who are both also instrumental to the achievement of organizational objectives.

This role structure, wherein organizational owners, managers, and frontline staff interact in a shared bureaucratic organization, is familiar and has been the setting in which managerial control has played out for decades (Taylor 1911, Mayo 1933, Roy 1959, McGregor 1960, Zuboff 1989). But as several scholars recently note, there is a new actor in the contemporary socioeconomic landscape: the platform company, which is fundamentally reconfiguring that familiar role structure (Gillespie 2010, Davis 2016, Kuhn and Maleki 2017, Vallas and Schor 2020). Although there are many types of platform companies, of relevance to our current inquiry is the *platform labor market* (e.g., TopCoder, Guru, Gigster, Catalan), which provides a digital infrastructure connecting client managers (i.e., those using the platform to hire and manage workers for their projects) and workers for short-term, expertise-based work, such as software development, content creation, animation, and business consulting (Horton 2010, Kuhn and Maleki 2017). The platform labor market's digital infrastructure usually enables client managers to search, hire, manage, rate, and pay contractors. This triadic arrangement among platform company, client manager, and contractor changes the "geometry" of power and control in these relationships (Vallas and Schor 2020, p. 282). That is, the way in which power and control is distributed between each actor reflects a new role structure: the platform company retains control over platform operations, data, and revenues but relinquishes control over who registers as clients and workers, their respective work processes, and the completion of performance evaluations.

As such, new research is needed to develop a deeper understanding of how client managers attempt and achieve managerial control in platform settings. The client manager has access to platform tools that somewhat resemble the bureaucratic tools employee managers have in traditional organizations; but the former are different in important ways. For example, employee managers' interactions with and decisions impacting workers are subject to more formal, structured oversight. Even though, for example, employee managers have authority to conduct performance evaluations that shape workers' careers, such evaluation processes are subject to human resource protections, such as requiring documentation for warnings related to poor performance (Cappelli and Conyon 2017). In contrast, although client managers also have authority to conduct performance evaluations shaping workers' careers, those evaluations are subject to very little required documentation or codified processes (Abrahao et al. 2017, Chan and Wang 2017, Hannak et al. 2017). Another important difference between managers' use of organizational and platform tools is the visibility of impact on workers. Unlike in traditional organizations, for example, platforms post client managers' evaluations of workers on workers' public profiles with lasting consequences for future work prospects (Leung 2014, Pallais 2014).

Moreover, the role relationship between client managers and workers is different than that of their organizational counterparts because of the platform intermediary. The platform employs neither the client manager nor the worker, does not invest in or structure their career development, and does not provide much cultural support for their ongoing relationship (Kuhn and Maleki 2017). Scholars have suggested that the platform tools, lack of shared bureaucratic and cultural context, and "gig" employment structure with a platform intermediary all create the potential for coercive control and outsized power in the client manager relative to the worker (Shapiro 2017, Rosenblat 2018, Gray and Suri 2019). But, to date, little research has investigated how client managers actually attempt control—and with what consequences—in these platform-mediated gig projects.

This paper aims to develop new understanding about client managers in platform-mediated work and to connect that understanding to extant theories of managerial control. We conducted an inductive field study of how client managers attempted control in gig software development projects with skilled platform contractors. We focused specifically on situations in which client managers encountered unexpected events, defined as events that disrupt previously held expectations about what should be happening in the situation, common occurrences in complex work settings (Kellogg et al. 2006, Bechky and Okhuysen 2011, Rahman and Barley 2017). Our analysis revealed that, when client managers used available platform tools to exert coercive control (i.e., to compel compliance using threat or force), such as by threatening low ratings, withholding wages, threatening on-demand replacement, or filing a platform dispute, the interactions escalated or halted, and the projects were left uncompleted. But, when client managers engaged in a set of practices we call "collaborative repair," contractors completed their project work. We define collaborative repair as interactions that surface misaligned interpretations of a situation and help parties negotiate new, reciprocal expectations that restore trust and willingness to continue an exchange. Our data show that client managers exercised discretion in responding to unexpected events; when they chose early to attempt

collaborative repair, this yielded a fuller understanding of breakdowns and a shared investment in new expectations, thus facilitating effective control and project completion.

Taken together, our findings demonstrate that the client manager role does shift the geometry of power and control compared with our previous understanding of employee managers (Vallas and Schor 2020) but not in a straightforward way in which the client managers become more powerful and able to exert coercive control directly. Instead, the client manager–contractor relationship is comparatively more brittle than the employee manager–worker relationship in a traditional organization. Although it may seem that managers who maintain a tight grip on relatively powerless workers are able to coerce workers to complete projects, in platform-mediated relationships, client managers who are more relationally focused, collaborative, and helpful are actually more likely to sustain a relationship with workers and achieve desired outcomes. We discuss implications of these findings for theories of control, repair, and platform-mediated work.

Managerial Control and Desired Outcomes

In prior research, "managerial control" refers to the systems or practices that employee managers use to direct attention, motivate, and encourage workers to act in ways that support the organization's purposes (Long et al. 2002, Cardinal et al. 2017). This body of research provides a comprehensive account of employee managers' tactics and related organizational outcomes, such as those related to innovation, morale, smooth workflows, and task-related or financial performance (Cardinal et. al 2017, figure 1). Here, we review this literature to understand the nature of employee managers' managerial control and its consequences. These studies conceptualize control as a relational dynamic that plays out between managers and workers over time (Edwards 1978). Managers establish and enact multifaceted technical, bureaucratic, and normative control systems to which workers respond by adapting, internalizing, or resisting (Braverman 1975, Burawoy 1979, Kunda 1992).

As an example of these multifaceted organizational control systems, many employers in the 1980s and 1990s attempted control by configuring computer terminals to use keystrokes to measure productivity, accuracy, response time, and time away from the computer (Marx and Sherizen 1986, Zuboff 1989, Dworkin 1990, Ottensmeyer and Heroux 1991, Bates 1995). Workers in these systems experienced a sense of constant surveillance even in the absence of direct supervision and conformed their behaviors to avoid managerial direction and discipline. Similar uses of technical, surveillance-oriented measures to induce self-control among workers and achieve desired behaviors have also been described in call centers (Batt 1999, Taylor and Bain 1999, Callaghan and Thompson 2001), banking (Marx and Sherizen 1986), food service (Jermier et al. 1994), retail (Gamble 2006, Thompson and van den Broek 2010), and airports (Anteby and Chan 2018). However, related studies also show that technical control *attempts* are not always associated with desired organizational outcomes: many studies characterize how workers resist such invasive technical control by sabotaging equipment (Ramsay 1966, Haraszti 1978, Juravich 1988), developing alternative technical procedures (Bensman and Gerver 1963), and collectively withholding effort (Gouldner 1954, Roy 1959).

Other studies identify additional mediating processes between managerial control attempts and worker responses. This research reveals that workers responded to multifaceted control systems by internalizing their organization's desired behaviors as worthwhile and consistent with their professional identities. As one example, Alvesson and Kärreman (2004) analyzed the intertwined control tactics a management consulting firm used and found that consultants identified with these systems rather than resisting them as coercive. The consultants were "under constant performance evaluation" and were ranked into different categories that determined their salaries, career development, and perks; nevertheless, consultants incorporated the evaluation system and differential rewards into their professional identities and strove consistently for positive evaluations (Alvesson and Kärreman 2004, p. 431). Research has consistently found that control systems organized around performance targets focus people's collective attention, emotion, and energy through concerted efforts (Barker 1993, Mazmanian and Beckman 2018). In sum, prior studies suggest that managers set up systems of control that influence workers' cognitive or affective states to promote desired behaviors. Research consistently shows that managers also enact these systems in discretionary ways as they interact with workers—a theme we develop further.

Extending Theories of Control Beyond Traditional Work and Employment Settings

This paper draws on and extends these prior theories of control to develop new understanding of managerial control in platform settings based on the nature of contractual relationships among platforms, client managers, and workers. Work mediated by intermediaries is not new, and prior research has explored dynamics of contract-work management (Goodman and Goodman 1976, Meyerson et al. 1996). Several studies also note how contractors and consultants pose challenges to how we conceptualize the relationship

and experiences of these workers with regard to managers (Fincham 1999, Werr and Styhre 2014). The proliferation of platform companies, however, makes it necessary to extend this research to new territory because control is distributed between platforms, client managers, and workers in ways that we are just beginning to understand.

In particular, building on Vallas and Schor's (2020) contention that platforms are different from previously studied exchange systems (e.g., markets, hierarchies, networks), we identify four differentiating features of platform settings. First, platforms capture profits by digitally matching client managers with workers but avoid responsibility and liability related to what happens after a match is made. Second, relatedly, platforms have little control over who joins their platform or when they use it compared with traditional work settings. Third, because platforms do not oversee what occurs after a match, they rely on client managers to assess workers' performance (Pallais 2014) even though these client managers have no explicit ties to the platform. Specifically, platforms provide a suite of platform tools for hiring, directing, evaluating, and disciplining workers (Danaher 2016, Kellogg et al. 2020). Finally, these client managers, though responsible for overseeing platform-mediated projects or gigs, are independent and may not actually have experience managing workers or expertise in many, or most, of the technical domains involved (Barley and Kunda 2006). Taken together, the combination of retaining and ceding control over these aspects of the labor process represents a marked shift from how work relationships are structured in previously studied exchange systems (Stark and Pais 2021).

Thus, more research is needed to understand the nature of managerial control on platforms used for complex work projects (Kittur et al. 2013, Barley et al. 2017, Kuhn and Maleki 2017, Retelny 2017). Some prior work, especially in communications, anthropology, and media studies, has begun to characterize the nature of work in platform settings, offering some insight into the nature of control (Danaher 2016, Shapiro 2017, Kellogg et al. 2020). For example, it is shown that some new platform technologies and work settings introduce even more surveillance than in traditional settings along with a related psychological state of perpetual supervision (e.g., Rosenblat and Stark 2016, Shapiro 2017, Anteby and Chan 2018, Zuboff 2018). Additionally, some of these online work platforms use powerful measures to restrict unwanted behaviors, such as worker collaboration (Irani and Silberman 2013), and can also limit collective resistance because the workforce is online and distributed (Irani 2015, Rosenblat 2018). Nevertheless, this research area is still forming and to date has focused more on routine tasks, such as image labeling or food delivery (Shapiro 2017, Gray and Suri 2019). In some of these contexts, the platforms almost completely disintermediate client and contractor interactions and may also block contractors from contacting employees at the platform (Shapiro 2017, Rosenblat 2018, Gray and Suri 2019).

But still missing from this extant research is an accounting of the platforms that match client managers and contractors for ongoing, complex gig projects (Retelny 2017, Valentine et al. 2017). These open-ended projects require continued interaction along with autonomy and discretion for both the client manager and contractor. We focus on a case of platform-mediated control wherein client managers used platform tools to hire, direct, evaluate, and reward contractors on complex software "gig" projects.

Repair in the Context of Managerial Control. As suggested, managerial control is understood to involve both the features of a workplace situation—including technical and bureaucratic systems and normative culture—and managers' interpersonal behaviors with workers that bring these systems to life in discretionary ways. As one example, Anteby and Chan (2018) report how TSA managers achieved control through discretionary sanctions against TSA agents caught violating workplace rules, including written warnings or reprimands and denied bonuses or promotions (for other examples, see Sewell 1998 and Batt et al. 2009). In contrast, Anteby (2008) shows how managers achieved control in a manufacturing setting by using discretionary leniency: allowing some workers to take materials for personal use, which was prohibited by official workplace policies. Such leniency is an example of employee managers *refraining* from coercive acts to develop and maintain control (see also Gouldner 1954, Blau 1955, Roy 1959, Burawoy 1979). In our study, we observed another example in which client managers refrained from coercive actions to achieve control of project outcomes: they directly addressed unexpected events and problems, which seemed more akin to an active repair process than to leniency or the absence of punitive measures.

To develop this idea, we now review past research on breakdown and repair. This work focuses less on manager and worker relationships but can be extended and understood as relevant for the interactions we observed. When people interact, they tend to assume that each has similar interpretations of the situation for most practical purposes (Heritage 1984, Garfinkel 1991). They maintain this assumption of "reciprocal perspectives" so they can trust each other and interact in comfortable, efficient ways without needing to interrogate the other regarding specific views (Schutz 1962, p. 11). Many social interactions

unfold seamlessly under such assumptions. But, when unexpected events or behaviors—sometimes called "breaches" or "breakdowns"—occur, it disrupts trust and mutual expectations (Schegloff 1992). Studies explore the nature of various breaches, analyzing why certain unexpected events or behaviors disrupt people's willingness to continue social interactions. These studies also examine what people do to "repair" the breaches or how they help one another overcome the realization of misaligned or disturbed expectations and return to some level of trust and shared expectations.

In this context, *breaches* are defined as unexpected events or behaviors that disrupt people's trust that their expectations are reciprocally held by interaction partners (Feldman 1995, Heaphy 2013). Individuals tend to interpret the disrupting event as "willful and meaningful," thus feeling disturbed, upset, indignant, afraid, or surprised because their sense of a "shared social world" has been challenged. As an example, Heaphy (2013, p. 1302) shows that patients receiving hospital care felt betrayed by experiences that disrupted their taken-for-granted sense that "the hospital was trying to help them and that by coming to the hospital they would be well cared for." The patients were also distressed by interactions that made them realize their expectations about their authority to make certain decisions were misaligned with staff's expectations (Heaphy 2013). Other studies show that employees encounter breaches when their employers act counter to worker expectations that they will receive fair treatment and payment (Morrison and Robinson 1997). Breaches also arise from unexpected *system* behavior, not just from interpersonal treatment. For example, Sachs (2019) describes the breach and repair process when a group of experts confronted unexpected outputs from a celebrated proprietary algorithm. Bucher (2017) characterizes breach and repair dynamics when users' Facebook feeds recommended irrelevant output; their reactions revealed their betrayed expectations that the underlying algorithm would reflect their understanding of themselves.

Studies in this area also examine how people *repair* the breaches that reveal misaligned expectations such that all parties are willing to continue with the situation or relationship. The specifics of the repair often depend on the nature of the breach and the relationship between parties. But, at a general level, this substantial literature depicts a collective social process that involves surfacing divergent interpretations of the breach and situation, negotiating a shared explanation of the breach and new expectations, and taking actions to prevent further breaches. As a specific example, Heaphy (2013) describes how patient advocates repaired breaches in a hospital setting. The advocates talked to patients and involved staff to discover the disparate understandings of the situation that led to the breach. They would then either explain how a hospital rule had not been followed and how the facility would ensure compliance in the future or would help patients change their expectations to better align with established hospital rules about their role and authority as patients. Sachs (2019) describes a similar general process that unfolded when art experts encountered unexpected output from their companies' celebrated algorithm: they expressed and negotiated their individual interpretations and then collectively discussed their assumptions that explained the breakdown and ultimately "implemented a repair" that involved adjusting the data or protocols involved in producing the unexpected output. In general, these social processes of repair involved determining what situation had yielded violated expectations and what needed to change to bring the situation and expectations back into alignment.[1]

In this paper, we draw on and extend this research on breaches and repair by conceptualizing repair work in the interactions between client managers and contractors in a platform setting. We particularly draw upon the notion of repair that involves discovering and negotiating different interpretations to take action. Prior research examines situations in which clients' expectations or employees' trust and organizational identity are breached (Morrison and Robinson 1997, Heaphy 2013, Petriglieri 2015), but few studies have explored how managers react to breaches in their expectations of worker behavior and related implications for their authority and control. Breaches to managers' expectations seem likely given that complex sociotechnical work unfolds unpredictably, often requiring repair and adjustment of expectations (Orr 1996, Suchman et al. 1999, Jackson 2014, Sachs 2019). We develop new understanding of managers' involvement in repair work through an inductive study of platform-mediated managerial control.

Methods

Research Setting

Platform labor markets are internet-mediated digital platforms that connect client managers to an "on-demand" online workforce, including millions of highly skilled workers worldwide, for completion of complex projects and tasks (Horton 2010). Recent estimates indicate that platform labor markets are among the fastest-growing digital platforms with earnings for workers projected to rise from $1 billion in 2012 to $16 billion in 2020 (Chan and Wang 2017).

We examined contract work on one of the world's largest platform labor markets: HireWork (a pseudonym).[2] In 2015, HireWork had more than 12 million

registered users—about nine million contractors and three million client managers—across 100 countries. That year, employers posted three million projects, generating more than $1 billion of work. At the time of this research, HireWork differentiated itself as a platform on which managers (i.e., client managers) with little technical skill could hire workers (i.e., contractors) for complex, high-skilled work, such as software, mobile, and web development; graphic design and animation; and sales and marketing.

HireWork facilitated direct relationships between client managers and contractors. Client managers were to create a project description (e.g., designing a new mobile application), specify a project category (e.g., software development, graphic design, administrative support, sales and marketing), and hire the contractor. Optionally, managers could specify skills required, estimated project duration, and desired experience level. Once the project was posted on the platform, any contractor could view the posting and submit a bid. Contractors' bids were blind (i.e., only the client manager could see them, and contractors could not see others' bids). Contractors were at liberty to submit information, including their work history, photo, sample projects, video logs, or skills and certifications. Client managers could review the bids, information provided by the contractors, contractors' location, and any feedback contractors received from previous client managers.

Client managers and contractors could work with anyone on the platform regardless of location. HireWork provided a messaging system that parties could use to post text-based messages and share files. Additionally, the platform provided client managers four features to manage projects and contractors: setting and changing contractors' contract length, setting and changing contractors' compensation, providing contractors with publicly available ratings,[3] and filing formal disputes.

Data Collection and Analysis

We began this project with the broad goal of understanding the work dynamics of a platform labor market. Thus, our first step was to register as a client manager on the platform to gain experience with the types of features HireWork provided managers to manage contractors. Once registered, we posted a job on the platform inviting participants contractors to share their experience of working on HireWork through paid interviews. Additionally, because we wished to secure a broad range of perspectives, we invited other client managers to share their experience using HireWork. Because HireWork did not provide formal means of contacting or hiring client managers through the platform, we reached out to client managers that contractors suggested would be willing to be interviewed as well as to personal contacts who used the platform as client managers. Each semistructured interview lasted between 30 minutes and one hour.

We posed broad questions to elicit contractors' and client managers' emic experiences with HireWork (Spradley 1979). After conducting interviews with 15 contractors and 15 client managers, we observed that all the contractors and client managers, regardless of their HireWork experience volume, described the difficulty of working on projects in an online, distributed market and, particularly, the difficulty associated with unexpected project-related events. Given this theme's salience, we wished to gain deeper understanding of factors driving completed and uncompleted project outcomes.

Although additional interviews provided insight into informants' retrospective accounts of project dynamics, we sought a more nuanced, emergent grasp of their actions during projects (Barley and Kunda 2001). As such, we asked whether HireWork was willing to share its data, finding that the platform had never qualitatively examined conversations between client managers and contractors, and how analyzing these conservations may influence project outcomes.

HireWork ultimately agreed to provide the real-time communications associated with 84 complex software development projects completed by unique client manager–contractor dyads.[4] These data included all of their interactions as they posted, matched, negotiated, and completed project work. We sampled software development projects because these represented the most common job on HireWork and involved complex work and because we wanted to analyze data only from the same job category. The projects were randomly selected within the year of our negotiations, conditional on the project outcome: 42 completed projects and 42 uncompleted ones. The latter were those canceled formally by the client manager or contractor as recorded on the HireWork platform.

We chose project completion as the main project outcome based on our conversations with contractors, client managers, and HireWork; all described this measure as the primary signal of success. We recognize that project completion, as an extreme dichotomous variable, enables us to analyze what led to fully failed projects but does not permit us to analyze or make claims about more continuous or nuanced outcome variables, such as quality, efficiency, budget adherence, or satisfaction.

Because of the sensitivity of the data, HireWork's user agreement, and legal terms and conditions, we hired a third-party firm to anonymize and remove any identifying information from the conversation histories before they were shared. Additionally, to

protect the anonymity of the focal client managers and contractors, HireWork did not provide any information that could link the conversations with parties' identities, such as their profile information, past project history, experience, or ratings. The data provided included the type of project (i.e., software development), real-time conversation data, and project start and end dates. The real-time communication data comprised messages sent using HireWork's shared messaging system, which was built into the platform as the only common communication system. Client managers and contractors could arrange communication outside of HireWork; however, in supplemental interviews, informants told us they preferred the HireWork messaging system because it allowed central, unified storage of their communication history and was the primary information source HireWork would use in the event a formal dispute was filed.

Moreover, by relying on the shared messaging system, client managers and contractors did not have to share their personal communication information. We found this to be consistent: client managers and contractors did not appear to use other media of communication as their primary mode of interaction. In fact, one contractor mentioned that in her five years on HireWork, she had used an outside communication system only one time (a coordination video call that lasted only a few minutes before the project began using the platform's shared messaging system).

Client managers and contractors used HireWork's common messaging service to exchange instructions, files, project information, discussions, thoughts, small talk, updates, and negotiations. Our data included these messages between client managers and contractors for the project's entire duration, including situations in which a project was suspended and then resumed. Each communication history began with the first conversation between a client manager and contractor (which could, and often did, occur before a client manager hired a contractor) and concluded with the last message between them. To our knowledge, these unique data provide the first opportunity to study interactions that occur *during* a project in a platform labor market, shedding light on what happens between client managers and contractors while a project is ongoing.

Finally, to understand possible reasons why projects ended with different outcomes, we collected publicly available discussion board data from HireWork. Contractors on the platform posted messages about their questions and experiences on the discussion board. Unlike our other data, the discussion board enabled contractors to write about and share their experiences with other contractors. We specifically collected messages in which contractors explained why they responded in certain ways when client managers tried control tactics that we observed in our conversation data (i.e., "theoretical sampling"). Overall, the interview, matched-sample, and discussion board data provide unique information to understand and triangulate how client managers and contractors responded to unexpected project events. Table 1 provides a more formal overview of the data we collected and how we used each data source in our analysis.

We followed an inductive, grounded-theory approach to analyzing the initial interviews and communication records between client managers and contractors (Charmaz 2006, Corbin and Strauss 2014). We began by open-coding the interview data. As discussed earlier, a salient theme across interviews was the difficulty of working in a platform labor market, especially as related to unexpected events. To gain a

Table 1. Data Collection Overview

Type	Description	Use in analysis
Interviews	30 total interviews 15 client managers 15 freelancers	Broad understanding of client managers' and freelancers' experiences using HireWork Highlighted difficulties both faced in working in a distributed, platform mediated setting
Real-time communication data	84 unique, anonymized client manager and contractor communication records from software development projects spanning the first to last communication between the dyad Half (42) of the projects were randomly selected conditional on the projects being completed, and the other half (42) were selected conditional on being uncompleted.	Practice-level understanding of the factors contributing to different project outcomes
Discussion board data	Theoretically sampled seven discussion board topics in which contractors shared their experiences and questions related to dealing with client managers	Supplementary data to identify possible reasons why contractors responded in certain ways that were not included in the real-time conversation data when client managers tried control tactics that we observed in our conversation data

practice-level understanding of what contributed to different project outcomes, we moved to inductively analyze our archival data: the real-time conversations provided by HireWork. When coding these data, we deliberately obscured the project outcome information to ensure the outcome did not sway our analysis. That is, when coding the archival data, we did not know whether the project had been completed or uncompleted.

After open-coding each communication record, we compared codes between projects to identify situations and themes that both were common across projects and differed depending on project outcomes. When comparing codes across projects, we identified three main project phases based on the concentration of practices observed: initial project communication, project updates, and ending a project. That is, we found that certain client manager and contractor practices were concentrated in each phase. For instance, we observed specific types of issues and corresponding practices in the second project phase that were not present in the initial project phase because no work had been completed at that point; in the first phase, for example, we did not observe client managers requesting project updates or contractors submitting work for client managers to review.

More specifically, the first project phase involved initial project communication, which included client managers and contractors exchanging messages related to project timelines and technical specifications. For instance, in some first-phase communications, we noticed client managers and contractors clarifying which aspects of the project to prioritize, and other projects had minimal such initial communication because the nature of the project appeared straightforward. The second project phase involved communication around project updates. Here, we observed that client managers asked contractors for progress updates or contractors would submit an update to a client manager for review. The third project phase was demarcated by client managers and contractors taking steps to end the project, depending on what had transpired in the second project phase.

Through continued, iterative coding, we tracked the practices client managers and contractors enacted for all projects across these three project phases, focusing our unit of analysis on the practices client managers and contractors used in each phase. When examining the practices in each phase, we looked for variances that could explain why some projects were completed and others ended prematurely. Comparing practices and interactions in the first project phase did not reveal noticeable differences: for both completed and uncompleted projects, client managers and contractors had varying degrees of communication about project timelines and specifications, which did not correspond reliably to what occurred in the second phase. Some projects with little communication about project timelines and specifications went on to successful completion, and others in which client managers and contractors spent more time clarifying project details up front, did not result in completion and vice versa.

Next, we compared the practices and interactions observed in the second project phase. We found that, on all projects regardless of outcome, client mangers encountered unexpected events. We coded an event as unexpected when a client manager's messages conveyed that the contractor's action disrupted their project expectations and led to alteration of the project in some way—such as to project expectations, timeline, budget, or scope—to mitigate the unexpected event. When comparing how client managers responded to these unexpected events, we observed consistent variance between communications related to completed and uncompleted projects. In particular, we observed differences in how client managers sought to control contractors to comply with their desired directive and outcomes in the face of unexpected events.

For uncompleted projects, we observed that client managers were more likely to have used coercive control practices. We labeled control practices as coercive if client managers tried to compel contractors to comply with their requests by threat or force mediated through the platform's tools. In contrast, for completed projects, we observed that client managers in the second project phase primarily extended an opportunity for contractors to collaboratively repair their work without using coercive control practices. Further coding showed that collaborative repair involved situations in which client managers and contractors were interdependent, meaning that the repair depended on the explicit sharing of all parties' interpretations, so they could negotiate a story for the breach and a develop a new set of expectations and actions to restore trust and a sense of shared expectations. To further refine our main theoretical construct, collaborative repair, we explicitly coded for who initiated the collaborative repair interaction and how the project proceeded once such repair was initiated.

In our next round of coding, we delved more deeply into the data to classify the types of unexpected events client managers encountered in the second project phase and the specific control practices client managers used for completed and uncompleted projects, again seeking reliable differences. Additionally, to analyze how practices observed in the second project phase related to the final phase, we used a constant comparative method between completed and uncompleted projects (Glaser and Strauss 1967).

This step led us to expand our initial coding of project outcomes and related client manager and contractor actions. For uncompleted projects, we coded whether the client manager or contractor ended the contract and whether a dispute was filed. For completed projects, we coded what client managers and workers gained beyond the exchange of wages for labor.

To further understand possible reasons why contractors reacted to client managers' control tactics, we analyzed discussion board data in which contractors spoke about situations observed in our conversation data. Coding these data shed light on why contractors were unresponsive or left a project and on how collaborative repair contributed to project completion. Finally, we assessed several alternative explanations, which we discuss in Online Appendix A.

The following sections also present tables detailing analysis and evidence related to our findings. In particular, Table 2 provides a more detailed analysis, showing each project in our archival database that had an uncompleted project outcome, which type of unexpected event the project involved, which coercive control practice the client manager attempted to use, and the project outcome. Table 3 shows each project in our archival database, which type of difficulty or misunderstanding it involved, the collaborative repair the client manager used to achieve control, and whether we found evidence of additional benefits that went beyond project completion (Online Appendix A provides a more detailed comparison of the practices we found in each project phase). Our findings detail the specific practices discovered in our analysis.

Findings

Our inductive analysis reveals that the main explanation for divergent project outcomes was how client managers reacted to unexpected situations during a project. Although unexpected events were characteristic of all the complex software projects in our data, what differed was the response of client managers. Some client managers quickly resorted to the platform tools in an attempt to control contractors, which tended to escalate conflict or halt the project altogether. In contrast, other client managers responded by engaging in a set of practices we call "collaborative repair" to understand and jointly address problems. We elaborate these findings in more detail, starting with the types of unexpected events client managers encountered.

Encountering Unexpected Events

For both completed and uncompleted projects, our analysis revealed two main situations that client managers considered unexpected. First, when the client manager asked for an update or the contractor submitted work for review, managers were caught off guard when they found issues related to work quality. In particular, because these projects involved complex software engineering work, several common types of quality issues arose, including "bugs" or "glitches" or nonfunctioning, incomplete code, and requested features that could not be or were not implemented (Metiu 2006). However, in part because client managers lacked technical expertise, we observed that client managers tended to be surprised and to raise concerns after contractors submitted work that contained what managers believed were errors. We labeled these types of events as unexpected as a result of "work quality" because client managers' core concerns were related to their perception of contractors' submitted work. Second, client managers' communications also revealed breached expectations when they believed contractors were not responding to their messages or requests for updates in a timely fashion. We labeled these unexpected instances as "contractor unresponsive." Table 4 shows examples of how both completed and uncompleted projects involved similar types of work quality and unresponsiveness issues.

As Table 2 shows, on 20 (48%) uncompleted projects, client managers expressed surprise related to the quality of a contractor's work (e.g., nonfunctioning code, bugs, glitches); on 27 (64%) completed projects, client managers encountered such issues. Tables 2 and 3 show that 25 (60%) and 23 (52%) uncompleted and completed projects, respectively, involved unexpected issues related to responsiveness. Despite the pervasive nature of these kinds of unexpected events, client managers' responses varied considerably. To illustrate these findings in detail, we first show what happened when client managers used platform tools to exert coercive control upon encountering unexpected events related to work quality or responsiveness. In the subsequent section, we analyze what happened when client managers instead engaged in collaborative repair to achieve control and contractors' compliance.

Platform Tools Available to Client Managers

HireWork provided client managers tools to control contractor compensation, project length, and rating evaluation. For example, the platform provided client managers almost complete control over contractors' compensation. Client managers could wait until a project was complete to release a contractor's compensation and could request a refund if they released compensation but later found issues with the completed work. On the other hand, client managers could also provide contractors with up-front payments and bonuses to signal their commitment and trust in the contractor. HireWork also provided client

Table 2. Project Level Analysis of Uncompleted Projects on HireWork (2013–2014)

	Type of unexpected event			Client managers' coercive practices							Project outcome		
Project ID	Work quality	Contractor unresponsive	Budget disagreement	Threatening to cancel project	Threatening bad review	Threatening to replace freelancer	Filing dispute	Requesting refund	Pausing project	Withholding payment	Client manager cancels	Contractor cancels	Client files dispute
1[a]	X									X		X	
2	X			X	X							X	
3[a]	X						X						X
4[a]	X						X	X					X
5	X			X							X		
6	X								X			X	
7[a]	X							X					X
8[a]	X							X				X	
9	X					X					X		
10[a]	X			X		X					X		
11	X			X	X							X	
12[a]	X			X							X		
13	X					X						X	
14	X							X					X
15	X				X							X	
16[a]	X								X			X	
17		X		X							X		
18[a]		X		X		X					X		
19[a]		X		X	X							X	
20[a]		X		X	X	X						X	
21		X		X							X		
22		X		X							X		
23[a]		X		X							X		
24		X							X			X	
25		X								X		X	
26[a]		X		X	X	X						X	
27		X							X		X		
28[a]		X		X		X					X		
29		X						X				X	
30		X		X				X				X	
31[a]		X							X		X		
32		X						X			X		
33[a]		X		X							X		
34		X		X				X			X		
35		X		X				X				X	
36		X		X							X		
37		X			X							X	
38[a]	X	X		X		X					X		
39	X	X				X						X	
40	X	X				X						X	
41	X	X		X		X			X		X		
42			X	X		X						X	
Percentage[b]	48%	60%	2%	52%	12%	26%	5%	21%	12%	5%	43%	48%	9%

[a]Indicates that data from this project was used in the main text findings, table, or appendix section.
[b]Bottom row represents the percent of projects with behavior observed. For example, work quality issues were observed in 48% of projects.

Table 3. Project Level Analysis of Completed Projects on HireWork (2013–2014)

	Type of unexpected event			Collaborative repair practices			Project outcomes beyond completion of project				
Project ID	Work quality	Contractor unresponsive	Budget disagreement	Task-based feedback	Coupling criticism with praise	Shared responsibility	Bonus	Up-front payment	Top ratings	Extended support	Decreased budget
43[a]	X				X			X			
44[a]	X				X						
45[a]	X			X							
46	X			X							
47[a]	X			X							
48[a]	X				X						
49[a]	X			X						X	
50	X							X			
51	X			X							
52[a]	X			X							
53	X										
54	X			X							
55[a]	X			X			X				
56[a]	X			X							
57	X			X							
58[a]	X			X	X						
59[a]	X			X							
60[a]	X			X						X	
61[a]		X			X		X				
62		X				X			X		
63		X				X					
64		X				X					
65[a]		X			X						
66		X			X						
67[a]		X		X							
68[a]		X		X							X
69		X		X							
70[a]		X		X						X	X
71[a]		X		X	X						
72[a]		X				X	X			X	
73[a]		X	X	X							
74		X			X						
75	X	X		X		X					
76[a]	X	X		X							
77	X	X		X							
78[a]	X	X				X					
79	X	X		X							
80[a]	X	X				X					
81[a]	X	X		X					X		X
82[a]	X	X		X					X		
83	X	X		X	X						
84			X								
Percentage[b]	64%	52%	5%	62%	24%	17%	7%	5%	7%	10%	7%

[a]Indicates that data from this project was used in the main text findings, table, or appendix section.
[b]Bottom row represents the percent of projects with behavior observed. For example, work quality issues were observed in 64% of projects.

Table 4. Similarity of Unexpected Events in Uncompleted and Completed Projects on HireWork (2013–2014)

Work quality issues in uncompleted projects (emphasis added)	Work quality issues in completed projects (emphasis added)	Contractor responsiveness issues in uncompleted projects	Contractor responsiveness issues in completed projects
This **bug** was never there in the first place (Table 2, project ID #7).	I try not to bother my programmer unnecessarily. But there is a **major bug** (Table 3, project ID #45)	I haven't heard back from you after my last two messages... Please let me know how things are proceeding (Table 2, project ID #31)	Not sure what happened last night. I didn't receive a response to any messages. I hope everything is okay. Please send me a message (Table 3, project ID #65)
Things on the admin panel **are not working**. I cannot make transfers or see their details. The delete button is gone. (Table 2, project ID #16)	But I noticed some issues with landscape mode. Like if I turn the phone to landscape mode, the views are all jumbled…Also, **I'm really having trouble understanding the code** unfortunately (Table 3, project ID #44)	I see no signs of you and no message from you (Table 2, project ID #38).	I haven't seen the updates you've said you'd send in, nor are there any recent commits pushed to github, so I'm getting a little worried (Table 3, project ID #78)
I reviewed the buglist that you worked on last week (via email). After reviewing the list you had said was done, **[the fixes] are not working**!! (Table 2, project ID #4)	One issue I am having is that when I open the saved workbook **I get an error message** (Table 3, project ID #58)	No response from you. What is going on? (Table 2, project ID #23)	You aren't replying to my messages. Is something wrong? (Table 3, project ID #61)
I **noticed that clicking the more apps animation is not opening the list view**. Please have a look at that also because without that there is no use of more apps button (Table 2, project ID #10)	I'm **concerned here because this needs to be an installable app**. If the phone asks for permission to install, that's okay. But we can't ask the end-users to go through some special process to make this work (Table 3, project ID #56)	It has been quite some time since we have received news from you (Table 2, project ID #19)	Hello are you there? Please reply. (Table 3, project ID #70)
When I asked you yesterday about the tasks that I sent you, you said they were completed (apart from the problem with the two databases.) However, it is not complete (Table 2, project ID #1).	I **have not received anything containing the changes which you** mentioned earlier today. In any event, please provide your next iteration and I will try to review it for you ASAP (Table 3, project ID #56)	I thought you said you would send me your first draft yesterday (Table 2, project ID #33)	I haven't heard a reply…I was just attempting to communicate with you concerning the program (Table 3, project ID #80)

managers the ability to control project duration with interactive platform interfaces; managers had complete discretion over how long a project lasted, including both pausing and cancelling a project at any time or extending a project or offering a new project to a contractor.

The third tool HireWork provided was the ability to rate contractors at the project's end. These numerical ratings were publicly displayed on the platform and influenced contractors' ability to secure future projects. Client managers expressed enthusiasm about the convenience of using these tools to "manage" contractors and projects with the "click of the button" (I-Client Manager-1).[5] A founder of an early stage start-up commented, "HireWork took a lot of stress off of growing with minimal resources" because it was possible to use HireWork to find talented contractors while committing "minimal" resources to them (I-Client Manager-7).

Contractor interviewees recounted frustration with the process, noting that the client managers seemed oblivious to how use of the tools could impact contractors' ability to secure future work on the platform. One contractor, for example, said that HireWork "was extremely skewed toward the client managers' favor" because client managers could assign ratings without any explanation or chance for contractors to dispute them (I-Contractor-3). As another contractor noted, it "takes a second for client managers to destroy a rating score, but it takes forever, forever to bring it back up" (I-Contractor-12). Although contractors strove to avoid situations in which client managers used the platform tools coercively, they were left with limited options when a client manager cancelled a project, withheld money, left a negative rating, or filed a dispute. Client managers were, thus, more focused on how to use the platform tools to complete a project, and contractors

resented the use of platform tools because it often hampered their long-term ability to secure future projects.

Client Managers Use Platform Tools for Coercive Control and Uncompleted Projects

Client Managers Exert Control Over Contractors' Compensation. Some client managers reacted to unexpected events with coercive control practices enacted through platform tools. One such practice related to client managers' control over contractor payments throughout a project. The HireWork platform was configured such that, even if a client manager paid a contractor for a portion of the work, the client manager could subsequently request a refund from the contractor. If contractors did not voluntarily return the payment through the platform, client managers could dispute the payment with HireWork. We observed some client managers exerting this control and requesting refunds when they felt the contractor's submitted work did not meet expectations. As an example, a client manager hired a contractor to develop a mobile application (Table 2, project ID #7). The client manager identified a bug in the contractor's submitted work and requested the contractor fix this bug because the client manager believed the contractor introduced it into the program through the work. After not seeing the progress expected, the client manager stated,

> This bug was never there in the first place...Look, I have spent $1,500 with you after we agreed to $500...This is ridiculous...I am not happy with your service and want this refund. The app is buggy, and I cannot use it (Table 2, project ID #7).

Notably, the client manager registered the complaint and a refund request. The contractor defended the payment received and also tried to provide an updated program addressing the client manager's concerns:

> We never agreed to $500. It was an hourly based agreement. Also, these issues which you are mentioning about were not included in that initial work [I submitted]. The issues were there from beginning, you can check that if you have older version of the code. I also tried to solve the 'disappear' issue in last code, which I have already delivered. Please have a look (Table 2, project ID #7).

The client manager, however, was not happy with the contractor's update:

> What you have sent me is no way different than to what it was [before the project began]! I have spent $1,500 with you on this app...I am not happy at all! (Table 2, project ID #7).

The client manager and contractor never agreed on when the bug entered the mobile application, much less how much compensation was warranted. After this message, the contractor stopped responding to the client manager, and the client manager cancelled the remainder of the project.

In general, contractors expressed that, when a client manager used the platform to request a refund, the contractor was left with few response options because the manager's refund request essentially signaled an end to the project with no compensation or rating. A contractor on the discussion board, for example, recounted,

> Today, I received a notification about an automatic refund request to the client for a portion of last week's work . . . I am unclear about this refund request and I guess that HireWork will not provide an explanation. What should I do in this case?

An experienced contractor responded to the message and explained,

> Nothing you can do other than hope that maybe the client fixes the problem and pays you in the end.

The experienced contractor highlighted that, once the client requested a refund, the contractor could do "nothing," much less continue working on the project, lest they risk the client manager escalating the situation further by filing a dispute as the next example highlights.

If contractors refused refund requests, client managers could attempt to coerce them to comply by threatening to file a formal dispute with HireWork. In the following project, for instance, a client manager hired a contractor to find and fix flaws in a soon-to-be-released mobile application (Table 2, project ID #4). After several days, the manager asked the contractor for an update:

> Could you send me an email of where you are on the buglist and if you are almost finished? (Table 2, project ID #4).

The contractor subsequently sent this message:

> I sent the email to you with the buglist attached (Table 2, project ID #4).

After reviewing the work the contractor submitted, the client manager said,

> I reviewed the buglist that you worked on last week (via email). After reviewing the list you had said was done, [the fixes] are not working!! I am not happy with this. . .I have already paid your funds for last week's work, and I still have a system that doesn't work right. I expect these problems to be fixed again by you and tested before sending it back, and this should be done on your time (Table 2, project ID #4).

The client manager's message indicated frustration with the contractor's progress (i.e., work quality) and went even further in a subsequent message:

> I won't pay again for the same things. I have just paid you $511.00 via HireWork. I will dispute this payment if you don't agree to fixing these problems. I await your reply (Table 2, project ID #4).

The client manager explicitly tied the ability to file a dispute claim with the contractor's agreement to fix the remaining bugs without further compensation. A dispute filed by the manager could have led to suspension of the contractor's account for the project in question or even for subsequent projects with new clients. The contractor reacted to the client manager's message:

> It's [i.e., the client manager's message] very disappointing. 5 of the bugs on the list are fixed, and there's [one] minor bug for the calendar. The other bugs are completely fixed. You think I've done nothing, but you're wrong. 4 of 5 bugs are fixed, 1 minor bug. I'm really disappointed by your message (Table 2, project ID #4).

The contractor became defensive and attempted to clarify progress made along with expressing disappointment with the client manager for failing to recognize the contractor's completed work, including several bugs fixed. The client manager responded:

> Our functions are still not operational; I am not happy with your findings. Nothing has been explained clearly at any time while working on the buglist. . .I am going to ask you in good faith to remove 5 hours from your work diary ASAP . . . [Otherwise] I will inform HireWork of my dispute (Table 2, project ID #4).

Thus, the client manager escalated the attempt to get the contractor to meet the demands by directly requesting a partial refund and threatening to file a dispute. At this point, the contractor tried to respond to the client manager, but the client manager followed through and filed the dispute. Once a dispute was filed, the platform automatically ended the project, marked it as uncompleted, and restricted the contractor's ability to contact the client manager through the messaging service; HireWork would now decide how much money, if any, would be refunded.

Contractors on the discussion board advised others to avoid disputes whenever possible because "when a dispute arises, it is not HireWork's policy to determine who is 'right' or 'wrong,'" and "you should probably realize that the HireWork system (and certainly the dispute process) is heavily biased toward the client." Another contractor on the discussion board shared that the contractor's "account has been suspended following a dispute that ended, and I was never notified [of the account suspension]." As such, when client managers threatened to or actually filed a dispute, contractors expressed that, knowing the low odds of winning, they had little choice but to acquiesce to the client manager's demands or cancel a project, lest they risk disruption of future opportunities through the platform.

Client Managers Exert Control Over Contract Length. Another way client managers used platform tools to exert coercive control was to pause or cancel projects. For instance, a client manager hired a contractor to develop a software program. After the contractor submitted a portion of the work, the client manager reviewed the submission and commented (Table 2, project ID #16):

> Things on the admin panel are not working. I cannot make transfers or see their details. The delete button is gone. Please fix this now. . .I hope you understand that I'm not happy with the work you are currently doing, and if does not improve, I will have to let you go. . .I hope you understand, this is nothing personal.

This client manager levied a threat to potentially release the contractor without prior warning. The contractor responded, trying to clarify progress made: "Hi. I already checked this [problem] and it's working. I fixed it last evening." The client manager did not believe that the contractor fixed the project to the client manager's liking and, though a new contractor was not immediately hired, paused the original contractor's contract:

> I have paused your contract. If by Monday the software is usable and bugs are gone, I will give you more work [i.e., continue the project].

By pausing the contract, the client manager prevented the contractor from logging additional time on the project for compensation. The contractor did not respond to the client manager, and the contractor cancelled the project.

Contractors were particularly frustrated when client managers paused a contract because the contractor lacked sufficient context to understand whether the manager intended to continue the project or would ultimately cancel it and assign a negative rating. A contractor on the discussion board, for instance, shared a situation: "A client hired me, then suddenly paused the contract without any warnings. . .what do I do in this situation??" The only actionable advice the contractor received was "the sooner you close it [i.e., the contract], the sooner it will STOP having an effect [on your rating]." In other words, upon the pausing of a contract, contractors were advised that their best recourse was to end the contract given uncertainty regarding what client managers would ultimately do. By closing the project before completion, contractors lost out on the opportunity to earn money, but they also denied client managers the ability to leave a negative rating that the

platform would publicly and permanently display on their profile.

Client Managers Exert Control Over Contractors' Rating Evaluations. Client managers also exerted coercive control by using the platform's convenient hiring and rating system to make threats. For instance, a client manager hired a contractor for a software engineering project. After not receiving updates as expected, the client manager reached out to the contractor and said (Table 2, project ID #18): "Can you please send an update on the project; otherwise, I'll need to hire someone else."

Other client managers went further, threatening bad ratings and highlighting the likely impact on the contractor's future work (Table 2, project ID #20):

> You do realize that an initial bad review will seriously hamper your chances to find more work on [HireWork] and opening multiple accounts will result in suspension from [HireWork] . . . Ultimately all I want is the code delivered as soon as possible, so if you can satisfy me that you'll be able to deliver quickly we can [resolve] the situation amicably (Table 2, project ID #20).

Thus, the client manager reminded the contractor that the manager could leave a public negative rating and review that would act as damaging signals to others who considered hiring that contractor through HireWork. In each case, the contractor did not respond, and the projects were ultimately cancelled, thereby limiting the managers' ability to leave a negative rating that could potentially limit contractors' future opportunities on the platform.

Note that this example illustrates another common theme in our data. We found client managers especially inclined to use coercive control practices when contractors were unresponsive. In part because of the distributed nature of projects and because contractors could work on multiple projects at once, they did not always respond to client managers as promptly as managers expected. We found that, when this happened and client managers exerted coercive control, the projects typically ended without contractors' further compliance and without the project being completed.

The common theme across these more coercive practices is that they jeopardize contractors' ability to secure future work on the platform, and contractors believe their best strategy is to avoid engaging with a client manager who threatens such actions, especially when the threat occurs without prior warning. Table 5 provides additional examples of client managers' coercive attempts to deal with unexpected situations.

Client Managers Initiate Collaborative Repair in Completed Projects

We now describe how collaborative repair contributed to completed projects in this platform setting. These projects involved the same kinds of unexpected events as those described earlier; however, client managers dealt with the problems differently as they attempted to achieve contractors' compliance. Our data reveal that, in client manager and contractor relationships, these first steps in the process of surfacing divergent interpretations of a situation tend to be at the manager's discretion but are critical to enable

Table 5. Coercive Control Practices in Uncompleted Projects on HireWork (2013–2014)

Client manager message	Coercive practices used
I am not happy with progress so far. You have not been able to produce sample apk that we can test that function per the mockups sent. I have made repeated requests to you to send samples, and most of them are not working. I cannot agree to continue in this way. You can keep the source code. I will start again and rebuild using different developer. The contract will be finished and I will give you bad review. I am very unhappy with your services (Table 2, project ID #26).	Cancelling contract, replacing contractor, threatening negative review
I have given some thought to the current situation and reviewed some of the difficulties you and I have had working on this project together and have decided to terminate the contract with you (Table 2, project ID #12).	Cancelling contract
At the beginning I specifically told you different times that the end goal is to get a prediction on how often a game will go over or under a specific point total. The way you model it, it does not do that. After spending a day and a half looking through your code I am having a hard time understanding it to reuse and reapply as needed, since the code has almost no commenting and confusing variable names. I could go on...For these reasons I think it is fair that you return $700 to me, and we stop working together (Table 2, project ID #8).	Requesting refund
I am going to raise a complaint against you in HireWork and let them decide who is wrong (Table 2, project ID #3).	Filing a dispute
I will have to find a new contractor if you have nothing to show me by tomorrow (Table 2, project ID #28).	Threatening to replace contractor

the rest of the repair process to unfold in a mutual and collaborative way. When client managers enacted collaborative repair when faced with difficulty on a project, they provided an opportunity for contractors to respond in a way that balanced their short- and long-term interests without the intimidation of coercive control tools that threatened future work. Contractors, in turn, responded to these actions by taking responsibility for work-related errors, providing potential ways forward, and more actively collaborating with client managers to resolve the situation.

Our data, thus, show that collaborative repair was necessary for completed project outcomes because both client managers' and contractors' understanding and perspectives had to be included in making sense of the unexpected event and realigned to create new expectations for the project to continue. Our analysis identified three primary practices that client managers used to initiate and support collaborative repair interactions: task-focused feedback, coupling criticism with praise, and shared responsibility (see Table 6 for additional examples). Herein we detail these practices, their consequences, and how we argue they contributed to completed projects.

Task-Focused Feedback to Support Collaborative Repair. When client managers of completed projects encountered work quality issues, their feedback focused on highlighting the task-related problem without threatening to use the platform's tools to compel a response. When client managers refrained from enacting coercive control practices and provided task-focused feedback only, contractors were more willing to take responsibility for work quality concerns, adjust their expectations, and continue working on a project. As an example, in the following project, a client manager hired a contractor to develop a software program. After the contractor submitted a portion of the project, the client manager reviewed their work and said (Table 3, project ID #45),

> I try not to bother my programmer unnecessarily. But there is a major bug: The user data can never be updated. No matter how many times I run, the .xml file remain the same. And there is just one single record in History.

When the client manager discovered a "major bug" in the contractor's submitted work, the manager could have exerted coercive control practices as other client managers (including those described earlier) did, but instead the client manager conveyed only the error or problem found. The client manager did not directly attribute the error to the contractor. Subsequently, the contractor replied,

> I am so sorry for that hitch. . .I will fix that problem and I am also working on the new updates and I will be done by tomorrow (Table 3, project ID #45).

The contractor took responsibility for the "hitch" in the submitted work, was willing to fix the problem, and remained engaged. Upon receiving the next update from the contractor, the client manager commented,

> Thanks for the new version. My impression is that it [i.e., the update] does implement all that I wanted. And the program is now working (Table 3, project ID #45).

Table 6. Collaborative Repair Practices in Completed Projects on HireWork (2013–2014)

Client manager message	Collaborative practices used
The timer app that you developed has bad where if I drag the green colored minutes circle and the press start button, the count down doesn't start. Can you please look at it. Use the source code attached with this message (Table 3, project ID #60).	Task-based feedback
Just wanted to let you know that today the app crashed about 5 times already. On the last crash the app did not shut down but all the screen within the app went all black (Table 3, project ID #67).	
This is so impressive!:) Great job on this!! I noticed that there's a black box that is fixed on the screen (from the map) when I scroll down on the phone. Do you get that issue too on your phone? I love your hard work. Thank you so much!:) (Table 3, project ID #44).	Coupling criticism with praise
I got the chance to try it out. This is great. Really close to what I was hoping for. The only changes I would ask for are in the UI. * For selecting all or none, can we just have small link text "all" and "none" that perform the two functions rather than a toggle checkbox? And can they be at the top of the list? * The word "[NAME]" in the unchanged folder select text box is confusing because a) the user might expect "[NAME]" to be a subfolder of their default downloads folder and b) not everyone uses "[NAME]" for default. My preference is for text box to be hidden and the text to say "[NAME] default." Other than those, this is really great. We will take through some QA today but so far it seems solid (Table 3, project ID #48).	
I am getting an error on the server saying "out of disk space" when I try to create a database or table. Can you work local for the next few hours until I get it figured out. The server has a 100 GIG available so I have a ticket into the ISP right now (Table 3, project ID #72).	Shared responsibility

The client manager's approach to dealing with the "major bug" gave the contractor a chance to fix the work without the threat of losing the project or receiving a negative rating, which ultimately contributed to the contractor's continued compliance and project completion.

We found that, even when client managers were more direct in pointing out errors and guiding the contractor to resolve these, contractors were responsive to manager concerns. For instance, a client manager hired a contractor to develop a database and generate reports based on the database. The client manager, however, noticed an error in the contractor's work. The manager reported the error and specifically requested that the contractor update the project (Table 3, project ID #52):

> I am getting the attached error when I open the Reports project. Looks like the ReportsView form is missing. Please correct this and send me the updated project.

In response, the contractor simply sent the requested update: "Kindly find the attachment for the report project. Sorry for the inconvenience. Ignore the previous project attachment" (Table 3, project ID #52).

As this example further illustrates, client managers initiated repair by providing task-focused feedback. This practice offered contractors a chance to focus on the technical features of the project rather than worrying whether the client manager would coercively use a platform tool to assert control and potentially impact their subsequent HireWork opportunities. In response, contractors took responsibility for technical errors and actively took steps to fix their work. When this occurred, client managers achieved contractors' continued voluntary compliance with their expectations, evidenced by contractors' ongoing engagement with managers.

Coupling Criticism with Praise to Support Collaborative Repair. We also observed client managers secure contractors' compliance when they coupled their criticism of the contractor's submitted work with praise, softening and contextualizing the unexpected problem. For instance, a client manager hired a contractor to design a mobile application. After reviewing the contractor's submitted work, the manager responded (Table 3, project ID #44):

> Thank you so much for your hard work on this:) . . . But I noticed some issues with landscape mode. Like if I turn the phone to landscape mode, the views are all jumbled. Do you know what is causing that issue? [Also] I'm really having trouble understanding the code unfortunately:(Where do I replace the URL of the web service if I want a different web server? Can you be very specific on what file I have to change? Also, where are the incoming received messages being parsed? What file should I look for?

The client manager encountered major issues for which the client manager could have easily exercised HireWork's coercive control mechanisms. In this case, however, the client manager began with thanking the contractor for the hard work and then proceeded to list specific questions and problems that were encountered. The contractor replied,

> Thanks very much. The program is designed to support portrait mode. I can restrict the screens to portrait only, if you want, as managing videos/images, with configuration changes to landscape also is very long and complex task. So I tried to make it simple. I apologize for the confusion. I will clearly explain each and every part of code with steps to follow within an hour as I am riding to home. I will soon send complete information about code and all classes. Again sorry for the inconvenience. Thanks (Table 3, project ID #44).

Thus, the contractor responded by detailing why the client manager encountered issues with the program in landscape mode as well as a way to address additional problems. The contractor also committed to providing more clearly documented code. The client manager appreciated the contractor's response: "AWESOME! Thank you:) Please take the time that you need. Thank you so much for your hard work!!" (Table 3, project ID #44).

With new, shared expectations of how to work together, the contractor continued to work on the project thereafter, and the manager was ultimately pleased with the final submitted work.

Another example further illustrates how managers used this practice to achieve control. A client manager hired a contractor to build a software program; upon testing the contractor's submitted work, the manager encountered an error (Table 3, project ID #58):

> Looks great so far! One issue I am having is that when I open the saved workbook, I get an error message: 'The file you are trying to open, [FILENAME].ext, is in a different format than specified by the file extension. Verify that the file is not corrupted and is from a trusted source before opening the file. Do you want to open the file now?' I answer yes and it opens fine. Is there a way to prevent that warning message? . . . Thank you.

The client manager started the message by praising the work the contractor had done so far and then relayed the error encountered. The contractor replied,

> What version of the program are you using? The Sales rep file is created for the 2003 version. When you try to open it using the latest versions, it will throw the message saying the file is in different format. Anyway, I am still

> trying to find a solution to that. I will let you know once successful (Table 3, project ID #58).

The contractor assumed the manager was using the same program version the contractor was using. Although this was a faulty assumption that caused the client manager to observe an error, the contractor remained committed to finding a solution. As in the previous example, this misunderstanding did not derail the project. Instead, by recognizing contractors' efforts and hard work, client managers contextualized their concerns. That is, even though client managers discovered major issues with the contractors' work, their recognition of the contractors' effort compartmentalized the issue such that managers highlighted the problem without indicating that they planned to escalate it. In response, contractors had the space to clarify their work and align their expectations without worrying about the client manager using platform tools to exert coercive control. Coupling criticism with praise, thus, helped client managers maintain contractors' voluntary engagement and contributed to project completion.

Sharing Responsibility to Support Collaborative Repair. Other client managers engaged in collaborative repair by taking shared responsibility for problems encountered during projects. Even though client managers hired contractors for projects, some clients chose to remain engaged in the work, providing suggestions to resolve any problems that the contractor encountered. For instance, a client manager hired a contractor to develop a computational text-analysis program that automatically read and processed certain texts. After reviewing the contractor's progress, the client manager replied (Table 3, project ID #55),

> I have reviewed it [i.e., the contractor's submitted work] and have these questions, etc.: When I used ReadAllLines, it was based upon reasonable RAM considerations. Do you have alternatives? For example, do we really want to read available RAM and then size chunks accordingly or would a simply comment that with today's contemporary desktop machines, the RAM assumed, for our purposes and chunk, should be reasonable? Why not use the alternative methods of Distinct and Sort vs. the looping and manually adding to a list? I seem to be missing something obvious when I'm looking at this;-).

The client manager not only asked about and suggested "alternative methods" to address the problem and also took the blame for "missing something obvious" as it related to the submitted work. The contractor subsequently responded to the client manager:

> This will have to be a relatively quick response as I've only got a few minutes unfortunately. In terms of RAM, I think that depends on the intended purpose. If this was something intended to run on a lot of different systems (i.e., as part of software distributed to customers/users), you'd want to have a conservative amount of RAM used. With that said, the current chunks of 100000 bytes are very well within reason, and I think comfortably could be raised by a factor of 100 without any adverse impact. If the program is going to only run on a single machine, the value can be set even more aggressively.
>
> In terms of the sort/distinct, I end up sorting before writing the chunks. I bypass checking for distinct because we still have to read the merge one at a time to find the lowest remaining value from each file. So I check for duplicates there instead. Let me know what changes you want specifically tonight and I'll get them in. ☺ Have a great day! (Table 3, project ID #55)

Even though the contractor indicated that the response was "relatively quick," the contractor provided a detailed explanation related to the client manager's questions. Additionally, the contractor asked specifically about near-term changes the client manager wanted. The client manager and contractor continued to engage in collaborative discussions and align their expectations of how to work together. This client manager even paid the contractor a bonus upon project completion. In general, we observed that some client managers engaged in the project's nitty gritty, subtly encouraging contractors to immerse themselves more fully in the project as well. Seeing managers willing to engage with them without the threat of using HireWork's tools coercively, contractors voluntarily engaged in joint problem solving and brainstorming.

Contractors on the discussion board spoke favorably about experiences in which they were able to respond to client managers' concerns without worrying about coercion. One contractor, for example, shared about enjoying a recent project because the contractor could "focus on delivering work" without worrying if the client manager would "torpedo their career with a negative rating." Another contractor on the board advised others that when facing client managers' questions about their work, they should try to "deliver the best service in whatever [project] you are in" because "there's no controlling" how client managers could use the platform tools.

Collaborative Repair Enables Continued Interactions

Our analysis suggests that client managers' initiation of collaborative repair processes made project interactions more likely to continue and manager–contractor relationships even more constructive. In many cases, client managers used the same platform tools others used coercively instead to reward contractors. For instance, managers were required to

pay contractors only after they had reviewed and approved submitted work. However, we found examples in which, after client managers engaged in collaborative repair and contractors responded favorably, managers were willing to provide up-front payment. In the following project, after the client manager and contractor worked through a misunderstanding and continued on the project, the client manager reached out to the contractor (Table 2, project ID# 43): "Let me know ANYTIME if you want any amount of up-front payment, and I will send it to you immediately."

The offer of up-front payment did not come without risk. For example, the contractor could have received the up-front payment and stopped project work. Yet this client manager used HireWork's compensation tool not to withhold payment coercively but to offer up-front payment, signaling trust in the contractor's ability to complete the project. After accepting the up-front payment, the contractor indicated significant progress: "Thanks for the up-front payment... I have roughly completed all three items of this task" (Table 2, project ID# 43).

Other client managers used the ability to provide rating evaluations and change the project's length to reward contractors for their efforts. After collaborating to determine how to resolve a problem with the project, a client manager signaled to the contractor that the client manager had left a perfect rating and opened a new contract to complete the remainder of the project: "I left full 5 stars to you and closed the contract and opened a new one" (Table 3, project ID# 82).

Note that, technically, client managers were not allowed to discuss the rating they gave contractors until the project was finished, and the contractor could also provide feedback; nonetheless, in this case, the client manager proactively communicated that a positive rating was provided and then used the platform's tools to create a new project, showing the contractor that the client manager would like to work with the contractor for a longer period.

Other client managers used HireWork's tools to leave the project contract open so that they could continue working with the contractor if the need arose. After completing a project, for example, a client manager conveyed the following to a contractor:

> I am keeping the contract open for now, if that is okay. . .We may want some more tests on this site in the next couple of days (Table 3, project ID# 71).

Client managers also enjoyed benefits from their continued interactions after enacting collaborative repair. At times, for instance, client managers claimed to experience decreases in their project budget, but contractors were willing to continue working with them, in part because of the positive relationship they had developed. In this example, a client manager conveyed to a contractor that the budget was lower than the client manager had promised for the project's next phase. The contractor, in turn, reacted (Table 3, project ID# 68): "It's OK if you do not have the budget now. I will work for you [at the lower rate] as we have great relationship."

Other contractors were willing to provide additional support after the project officially ended in case the client manager needed additional help. For instance, at the end of a project, a client manager and contractor exchanged the following messages (Table 3, project ID# 49). The client manager wrote, "If there are unseen issues, will I still be able to send you an email through [the platform labor market]?"

The contractor responded, "Yeah, Sure. Please do let me know if there's any issues. I will always look after you. You can always contact me."

Perhaps the clearest example of the mutual benefits when client managers and workers engaged in collaborative repair was in a project we observed in which the contractor responded favorably and continued to work on the project when the manager provided task-based feedback. When the project was near completion, the client manager reached out to the contractor and asked (Table 3, project ID# 82),

> I have one more question for this delivery. Would you like to be attributed in the commit log? Just something you can point to in your resume. Eventually we will be releasing most of this as open source. . .I can take your final delivery, conform it to our versioning and project layout, then commit it to our source control under your name. That way, when it hits GitHub, you will be attributed.

After receiving the completed project, the client manager could easily have published the project

Table 7. Client Managers' Use of Platform Tools on HireWork (2013–2014)

Platform tools	Coercive use	Rewarding use following collaborative repair
Compensation	Request refund	Up-front payment
	Withhold payment	Bonus
Contract length	Pause contract	Extend contract
	Cancel contract	New contract
Ratings evaluation	Leave negative rating evaluation	Provide positive rating evaluation

under the client manager's own name; contractually, the client manager retained all rights to the contractor's work. However, the manager was willing to give the contractor public credit and recognition for the work. The contractor was not only grateful for this recognition, but also willing to add features to the software program for no extra charge:

> Sure, that (i.e., being added to the commit log) would be great, thanks! I was thinking about adding some sort of progress indicator. I could do this at no extra charge. It would just show how many files are left remaining to download out of the total. I could also add an extra column that would show the status of the download, and it would say downloading or complete. Let me know what you think of this idea (Table 3, project ID# 82).

We observed that collaborative repair provided a path to continued interactions after a breach in expectations, and both client managers and contractors benefited from interactions beyond project completion—benefits neither side could have anticipated at the project's start. Table 7 summarizes the different ways we observed client managers used the platforms' tools.

Discussion

Our study examined how client managers attempt to maintain control when managing contractors on complex, high-skilled projects mediated by the HireWork platform. Platforms such as HireWork have altered the dynamics of control compared with those observed in bureaucratic organizations because "control is radically distributed" among the platform, client managers, and workers (Kornberger et al. 2017, p. 79). The HireWork platform provided client managers tools to control project outcomes, including to hire, reward, discipline, and evaluate contractors. Because these platform tools ostensibly offer more expansive control to client managers, existing theory suggests that managers could use them to effectively exert coercive control. Indeed, several studies have chronicled how workers are subject to client managers' whims on platforms (Glöss et al. 2016, Rosenblat and Stark 2016, Shapiro 2017). We found, however, when client managers relied on platform tools to exert coercive control over contractors, it backfired, contributing to uncompleted projects. On the other hand, when client managers initiated collaborative repair practices, refraining from using the platform's tools coercively, it contributed to project completion.

Implications for Control Literature

Prior theories of control were developed predominantly in the context of managers and workers who were employees in the same organization (Bendix 1956, Barley and Kunda 1992, Cardinal et al. 2017). As such, managers' attempts to control workers unfolded within established bureaucratic and sociotechnical systems and with the expectation of ongoing personal interactions. Even previous studies involving contractors, consultants, and customer service interactions are situated within an established organizational context and role structures (Fincham 1999, Evans et al. 2004, Werr and Styhre 2014). This research shows that managers were able to effectively wield different forms of control to direct workers' behaviors, especially when workers deviated from their expectations (e.g., Barker 1993, Batt 1999, Callaghan and Thompson 2001). Other studies show that employee managers accomplished control by avoiding coercive practices and using leniency in discretionary ways (Burawoy 1979, Anteby 2008).

Our study resonates with this prior research as we find that the work environment already signaled many of the behaviors expected of and accepted from client managers and contractors in ways that can be understood as managerial control but that the actual achievement of managerial control depended on the interpersonal interactions through which managers brought these systems to life. Our study extends prior work by demonstrating how these dynamics play out for the new role of client manager in the platform work setting. Our findings suggest that the client manager–contractor relationship may be particularly fragile, which has implications for how control is attempted and perceived. Specifically, our data reveal that contractors were keenly aware of the long-term impact that tools such as compensation, contract length, and rating evaluations could have on their long-term success on the platform—effects that would last far beyond their focal engagement with one coercive manager, in part, because project outcomes and rating evaluations were publicly posted. In other words, there was a kind of "latent" power and control reflected even in the availability of such platform tools for client managers. Contractors were wary of client managers' ability to imperil their future prospects on the platform and conducted themselves accordingly, such as by disengaging when confronted with managers' coercive use of platform tools, leaving uncompleted projects in their wake.

Our findings, thus, demonstrate that the new role structure and platform work environment shaped managers' capacity to accomplish control. The platform tools seemed to make the managers powerful and potentially more able to accomplish control because of their ability to significantly help or harm future contingent earnings. However, their use of those tools actually lessened their capacity to accomplish control because the contractors disengaged quickly to protect their prospects on the platform.

Our findings also contribute to control-related research by revealing an alternative path whereby client managers accomplish managerial control effectively despite having short-term, fragile engagements with contractors. When managers initiated collaborative repair practices in response to unexpected situations, it afforded them and contractors the opportunity to engage in continued interactions, which helped them negotiate a new set of reciprocal expectations that restored trust and willingness in moving forward with the project. In particular, collaborative repair provided contractors the opportunity to clarify and align their efforts with client managers' expectations in a way that balanced contractors' short- and long-term interests. In this context, the contractor did not face the threat that the client manager would deal with their concerns in a way that threatened the contractor's ability to secure future work on the platform. Provided with this opportunity to repair unexpected events, contractors responded in ways that collaboratively addressed concerns and advanced the project.

Our findings also relate to key findings in prior research that theorized how people accomplish authority and control in work relationships. For one, our findings resonate with Huising's (2015) study of relational authority, which shows that professionals were better able to gain their clients' compliance and goodwill when the professionals held on to "scut" work because they were able to develop *better understanding* of the clients' work and *better relationships* with the clients. In line with this, we identify how a different set of practices, collaborative repair, helped client managers interact more closely with contractors to develop a better understanding of the work and better relationships, thereby motivating contractors' compliance with their desired outcomes. Table 8 summarizes the collaborative repair practices we observed, how client managers initiated these practices, and the impact of these practices.

Though our findings indicate that platform-based client managers may not be able to accomplish coercive control in straightforward ways, we suggest that our results should be examined in the context of the precarity of the gig employment structure. Our findings focus only on specific client manager interactions and, in so doing, offer insight into that single aspect in the "geometry" of power and control established by platforms (Kornberger et al. 2017, Vallas and Schor 2020): in these specific dyadic interactions, platform tools do not automatically make client managers as powerful as we might expect. We cannot offer insight into other aspects of the changing geometry of power and control. For example, future research should carefully examine the subsequent career consequences for both client managers and workers when platform tools, such as negative ratings or platform disputes, are used and a project ends poorly. Future work should also analyze economic returns to platform companies, client managers, and workers from participation in this new relational structure, including who participates in platform work as client managers versus as workers and with what consequences for their socioeconomic positions (see, for example, Pedulla 2020).

Implications for Repair Literature

Our study also contributes to the research literature on breach and repair. Prior research examining repair in the context of work settings emphasizes the steps people take to address disrupted or breached expectations (Schegloff 1992, Heaphy 2013). Few of these studies focus specifically on managers' reactions when workers breach expectations. These studies also vary on what specific behaviors or events constitute repair (Heritage 1984, Garfinkel 1991). Our study contributes to this research in two specific ways: first, by developing an understanding of how client managers contribute to repair and, second, by advancing the idea that repair in some situations needs to be explicitly collaborative because it involves surfacing and aligning understanding from two or more parties as described in detail as follows.

First, we find that client managers played an integral role in repair by initiating interactions that

Table 8. Collaborative Repair Practices, Impact, and Outcomes on HireWork (2013–2014)

Collaborative repair practices	How client manager initiates collaborative repair	Contributing impact of collaborative repair practice on contractors
Task-based feedback	Client manager provides contractor with opportunity to address technical questions related to the work	Contractor takes on responsibility of repairing project and relationship and providing way forward
Coupling criticism with praise	Client manager recognizes contractor's hard work and contextualizes project problem or misunderstanding, allowing contractor to clarify and improve the work	Contractor exhibits continued engagement evidenced by clarification and sustained effort to address client managers' criticisms
Shared responsibility	Client manager shares responsibility in determining how to address and issue and encourages shared problem solving with contractor	Contractor joins client managers in clarifying and brainstorming next steps

facilitated an ongoing collaborative repair process. By engaging in more constructive and mutual approaches to unexpected events, client managers conveyed their desire that the contractor should continue working on the project and provided contractors an opportunity to clarify or amend their work to align with client managers' expectations. Given that client managers were, in some ways, more powerful than contractors in the platform setting because they retained unchecked control over workers' wages and evaluations, it might seem counterintuitive that repair depended on client managers' actions. Yet, precisely because the platform tools and structures favored client managers, contractors viewed client managers' actions in response to an unexpected event as a significant indicator of client managers' willingness to support continued engagement on the project or, conversely, to take actions that would ultimately damage contractors' standing on the platform. Studies of repair examine how some institutions structure specific jobs, such as patient advocates, to repair breaches with their clients (Heaphy 2013), but more research is needed to specifically explore how repair is initiated and sustained in relationships with power imbalances.

Second, our findings also describe the collaborative nature of repair. Other studies recognize repair as a social process, for example, involving discussion among teammates (Sachs 2019). Our findings build on this understanding by suggesting that each of these specific behaviors in the overall set of interactions is part of collaborative repair because it surfaces divergent interpretations; sustains ongoing negotiation of stories that explain the unexpected event and ongoing negotiations about how to align on new expectations; and establishes the concrete agreements, policies, or fixes that will prevent future breaches. In many settings, specific behaviors from multiple collaborating parties are needed to initiate, develop, and sustain collaborative repair interactions. We show the specific client manager behaviors that helped initiate and sustain collaborative repair with contractors in complex gig projects.

Our study reveals that collaborative repair might be considered a valuable and integral part of complex work. Many studies emphasize how complex, knowledge-based work always involves unpredictability—no matter how routine a project or task may seem at the outset or in which context the work unfolds (Kellogg et al. 2006, Bechky and Okhuysen 2011, Rahman and Barley 2017). Studies in diverse domains, including healthcare, software engineering, architecture, film crews, SWAT teams, semiconductor manufacturing, and research laboratories, for instance, highlight unpredictable dynamics similar to those in our focal setting (Bechky 2003; Kellogg 2009; Bechky and Okhuysen 2011; Huising 2014, 2015; Rahman and Barley 2017). Previous studies—and the current one—characterize unexpected events as disruptive, but our study highlights how such situations are inevitable to a certain degree, occurring on the majority of projects. Thus, future research can explore how different situational and relational factors shape repair interactions and processes. For instance, as more organizations and people shift to online, distributed work, we suspect collaborative repair will be integral to ensuring effective collaboration, especially considering the rapid changes and disruptions the shift to online, distributed work will have on people's work routines (Myers et al. 2020).

Implications for Emerging Forms of Work

Our paper also answers scholar and policymaker calls to investigate how emerging forms of work, such as platform labor markets, will shift our understanding of previous phenomena both theoretically and empirically (Barley et al. 2017). Although researchers are beginning to understand the economic impact and experiences of people using online platforms to find work (Pallais 2014, Katz and Krueger 2016), we lack a grounded understanding of the day-to-day experiences and impact of working on and using online platforms (Kuhn and Maleki 2017). Without studies of how work is organized and accomplished in this new setting, we risk forming an abstract, unrealistic view of the realities and impact of digital labor (Barley and Kunda 2001, Bechky 2011).

Many scholars, for instance, note that, although the form and function of platforms vary greatly, they are frequently lumped together under umbrella terms, such as "digital," "sharing," "gig," or "crowd" platforms (Vallas and Schor 2020). These broad categorizations obscure people's experiences using divergent platforms and overlook important distinctions in how work is accomplished. For example, Curchod et al. (2019) examine the relationship between eBay, sellers, and buyers. Although, on the surface, both eBay and HireWork possess power asymmetries over their users and provide buyers/managers with tools to monitor and evaluate sellers/workers, the nature of the interactions, type of work, and impact of using these tools vary from platform to platform. On eBay, sellers and buyers engage in spot transactions, which means sellers have comparatively limited agency and interaction with buyers. Further, sellers may accumulate dozens of ratings in a single week given the speed and quantity of items that can be sold on the platform, buffering the impact of a single negative rating. In such settings, we would expect fewer collaborative attempts to repair

relationships given the limited agency and interaction between buyers and sellers. Indeed, Curchod et al. (2019) describe how the onus is primarily on sellers to resolve disagreements with little incentive for buyers to initiate or become involved in resolving disputes. As a result, though power asymmetries exist in both settings, the social, technical, work, and legal dynamics of each platform vary considerably. Taken together, examining the different conditions workers encounter on platforms such as Uber, Fiverr, Airbnb, Amazon Mechanical Turk, TaskRabbit, and DoorDash will enhance our understanding of worker experiences specifically and the nature of power and control more broadly in platform settings.

Our findings, for example, highlight how complex work on platform labor markets requires a deeper assessment of how relational dynamics unfold in these settings and how these dynamics impact contractors' short- and long-term concerns (Ekman 2014). For instance, in the platform's design, HireWork assumed contractors would act in predictable ways and acquiesce to client managers' demands when they used the platform tools. This was not the case as our findings suggest that both client managers and contractors must be willing to adapt to changing expectations and circumstances as they continue to interact. This point resonates with Retelny et al. (2017), who show how routinized workflows commonly used in platform work quickly become obsolete, meaning that ongoing mutual adjustment is required for complex projects. Our work offers one way—collaborative repair—in which people can work together on high-skilled work in such settings. Overall, our study provides a detailed, nuanced look at people working in real time on an emerging online platform, illuminating both the challenges and opportunities of complex work in this new digital environment.

Boundary Conditions, Limitations, and Future Directions

Our study analyzes and reports fine-grained interaction patterns that can be understood as well-substantiated, varying processes with distinct end states (completed or uncompleted projects). Despite the strengths of these real-life, interactional data, our data set also has important limitations. First, the empirical pattern linking collaborative repair and completed projects and coercive control and uncompleted projects is binary as can be observed in the green columns in Online Appendix A. That is, there is little evidence of client managers using collaborative repair practices in the uncompleted projects and little evidence of client managers using coercive control tactics in completed projects. We interpret this fairly distinct pattern in two ways. The first is that the pattern reveals the strengths and limitations of sampling on the extreme dichotomous project outcome of "completed" or "uncompleted." The termination of projects via the client manager, contractor, or platform cancelling the contract is an extreme event that allows for this particular analytical contrast. We believe our sampling strategy enabled us to understand why the cancelled projects were so brittle; when the client managers involved confronted something unexpected, they seemed to react from a place of threat and blame and used coercive practices. Our sampling strategy also highlights the alternative approach—collaborative repair—that enabled relative strangers to navigate through unexpected events. Of course, the limitation is that our data and analytical approaches do not allow us to explore other patterns that might explain more nuanced and continuous outcomes in completed projects, such as those related to efficiency, quality, budget adherence, or satisfaction, in which collaborative repair practices might not be associated with more positive outcomes in such a stark way. In other words, we cannot make claims about *how well* the projects were completed—only that projects associated with collaborative repair were more likely to be completed and others were not.

The second, related point emerging from our analysis is that client managers had noticeably different *orientations* to unexpected events. Though all projects involved the same kinds of unexpected events, the conversation data reveals that client managers demonstrated an orientation toward either collaborative repair or threat/blame. Within those general orientations, client managers' practices varied considerably: not every client manager who engaged in collaborative repair used all the fine-grained practices we identified, nor did every client manager who reacted coercively use all the coercive practices. This is seen in the varying patterns of "Xs" in the green columns in Online Appendix A.

Additionally, we do not report or analyze demographic properties of either client managers or contractors. This limitation could matter if people with certain demographic characteristics are more likely to engage in collaborative repair and are also more likely to engage in other practices related to project completion that we were not able to observe. For example, it is possible that gender is an antecedent to a more collaborative, relational approach to unexpected events as well as linked to other practices that also influence outcomes. We cannot cleanly rule out the effects of such variables in our data and analysis. Still, we expect that it remains generative for theory development to have a description of the practices of collaborative repair regardless of participant attributes and hope that future research

explores whether people with specific gender-related or other attributes are more likely to engage in collaborative repair.

Further, our study took place in an extreme setting, highlighting important boundary conditions. Although our analysis reveals clear patterns, we do not mean to suggest that coercive control always leads to negative outcomes or collaborative repair always leads to positive outcomes on digital work platforms or beyond. There are myriad other factors, such as the type of work, relationships between workers and clients, and individuals' personalities and management skills, that impact how control plays out in a project. Although we explore some alternative explanations in Online Appendix B, we could not examine several other explanations. For instance, in routine work, such as data entry or administrative assistance, coercive control practices may be effective because expectations for what is required are clearer and easier to understand and frequency of unexpected situations may be lower; as a result, coercive practices may motivate contractors to respond favorably to client managers' requests. In our setting, however, client managers enacted coercive control practices on complex work projects in which it is difficult to specify exact requirements and expectations up front; they tend to evolve over time. In fact, many client managers seemed to lack technical expertise and relied on contractors to determine how to proceed on projects. Similarly, certain individuals, such as new workers, may be more motivated to complete a task even when coercive control practices are used to earn a positive rating early in their career. On the other hand, experienced workers with multiple projects may take advantage of a client manager's restraint and extend a project longer than required or deliver subpar work because one negative project outcome may not impact their overall career progression. These are all situations in which the complexity of real-life situations adds color and changes the effect of the overarching patterns we find in our data.

Although our data cannot speak conclusively to these extenuating conditions, future research could elaborate on how these different boundary conditions limit or accentuate the dynamics of control in different work settings. Moreover, at the time we collected our data, the platform labor market was operating with little oversight or regulation. As a result, client managers were able to enact almost any practice with minimal repercussions. In fact, managers could easily create multiple accounts, such that, if their account were suspended, they could easily switch to a new one. As more regulation and oversight are developed, contractors may have recourse beyond appealing to a platform with conflicting interests. Finally, although we tried to assess several alternative explanations, factors such as client managers' technical experience and previous experience may very well contribute to how projects unfold. Ultimately, more comprehensive, quantitative data, combined with qualitative insights, would enable researchers to assess when and to what extent factors beyond our study contribute to related outcomes.

Conclusion

Technological advancements have contributed to the fast rise and spread of platform organizations. As more work is mediated through these platforms, new questions arise given that the conditions in which these work relationships unfold differ from those in previously studied settings. Here, we studied how the nature of control has changed and the impact it has on platform-mediated project outcomes. We show that, when client managers extended what we called collaborative repair, client managers and contractors were able to successfully overcome unexpected situations to mutual benefit. It is our hope that our study and future research can continue to highlight how platforms and other emerging forms of work impact our understanding of work and organizing. Without such understanding, we risk an increasingly unbalanced geometry in which platforms reap massive rewards with little oversight and societal awareness and without the accrual of relational capital for the platform-mediated client managers and workers engaged in temporary gigs. Worst case, if platforms develop unchecked power with no accountability for workers' well-being and career development over time, there is a risk that workers will be treated akin to "ghosts," hardly noticeable and easily replaceable, unless other social institutions are developed to provide a much more dignified, stable holding environment that is more equitable and sustainable for all (Gray and Suri 2019, Petriglieri et al. 2019)

Acknowledgments

The authors are grateful to Steve Barley, Woody Powell, and participants in the Qualitative Methods Workshop at Kellogg for their comments in helping improve this paper. They also appreciate the thoughtful guidance of Ruthanne Huising and the generative feedback and engagement three anonymous reviewers provided, which helped strengthen the paper. They thank Naser Abdelrahman for his diligent research assistance and Sachin Waikar for his invaluable editing support.

Endnotes

[1] Note that studies in this area vary regarding what events in this ongoing process they consider "repair," sometimes including the whole process (discovering and negotiating different interpretations to take action) and sometimes referring only to the actions that prevent further breaches (e.g., creating new rules to improve staff compliance or changing data values to prevent unexpected output). Related literature examines the emotional process of "trust repair"

and analyzes whether specific behaviors, such as offering penance, denials, apologies, and excuses effectively restore trust (for review, see Kramer and Lewicki 2010).

[2] Because of the sensitivity of the data and our agreement with the platform labor market, we have kept the platform's identity confidential.

[3] Contractors could also rate client managers, but these ratings were not used on HireWork in any meaningful way. HireWork did not even enable contractors to sort job postings by ratings of client managers. Moreover, client managers were not shown their ratings when logging into the platform and could easily create a new profile if they felt a negative contractor rating might impact their ability to hire contractors. Finally, contractors expressed uneasiness about giving clients bad ratings because it might diminish their ability to secure future work. As one freelancer on a discussion board shared, "If a freelancer has the temerity to criticize a client by giving less than perfect feedback, that freelancer is not likely to be rehired."

[4] Each client manager–contractor dyad appeared once in our data set. Additionally, our data set consists of 84 unique client managers and 84 unique contractors.

[5] "I" demarcates that we are using interview data; the number is the unique identifier we assigned to each interview.

References

Abrahao B, Parigi P, Gupta A, Cook KS (2017) Reputation offsets trust judgments based on social biases among Airbnb users. *Proc. Natl. Acad. Sci. USA* 114(37):9848–9853.

Alvesson M, Kärreman D (2004) Interfaces of control. Technocratic and socio-ideological control in a global management consultancy firm. *Accounting Organ. Soc.* 29(3–4):423–444.

Anteby M (2008) Identity incentives as an engaging form of control: Revisiting leniencies in an aeronautic plant. *Organ. Sci.* 19(2): 202–220.

Anteby M, Chan CK (2018) A self-fulfilling cycle of coercive surveillance: Workers' invisibility practices and managerial justification. *Organ. Sci.* 29(2):247–263.

Barker JR (1993) Tightening the iron cage: Concertive control in self-managing teams. *Admin. Sci. Quart.* 38(3):408–437.

Barley SR, Kunda G (1992) Design and devotion: Surges of rational and normative ideologies of control in managerial discourse. *Admin. Sci. Quart.* 37(3):363–399.

Barley SR, Kunda G (2001) Bringing work back in. *Organ. Sci.* 12(1):76–95.

Barley SR, Kunda G (2006) *Gurus, Hired Guns, and Warm Bodies: Itinerant Experts in a Knowledge Economy* (Princeton University Press, Princeton, NJ).

Barley S, Bechky B, Milliken F (2017) From the editor: The changing nature of work: Careers, identities, and work lives in the 21st century. *Acad. Management Discoveries* 3(2):111–115.

Bates J (1995) An evaluation of the use of information technology in child care services and its implications for the education and training of social workers. *Soc. Work Edu.* 14(1):60–76.

Batt R (1999) Work organization, technology, and performance in customer service and sales. *Indust. Labor Relations Rev.* 52(4): 539–564.

Batt R, Valcour PM (2003) Human resources practices as predictors of work-family outcomes and employee turnover. *Indust. Relations J. Econom. Soc.* 42(2):189–220.

Batt R, Holman D, Holtgrewe U (2009) The globalization of service work: Comparative institutional perspectives on call centers: Introduction to a special issue of the Industrial & Labor Relations Review. *Indust. Labor Relations Rev.* 62(4):453–488.

Bechky BA (2003) Object lessons: Workplace artifacts as representations of occupational jurisdiction. *Amer. J. Sociol.* 109(3): 720–752.

Bechky BA (2011) Making organizational theory work: Institutions, occupations, and negotiated orders. *Organ. Sci.* 22(5):1157–1167.

Bechky BA, Okhuysen GA (2011) Expecting the unexpected? How SWAT officers and film crews handle surprises. *Acad. Management J.* 54(2):239–261.

Bendix R (1956) *Work and Authority in Industry: Ideologies of Management in the Course of Industrialization* (Wiley, New York).

Bensman J, Gerver I (1963) Crime and punishment in the factory: The function of deviancy in maintaining the social system. *Amer. Sociol. Rev.* 28(4):588–598.

Blau PM (1955) *The Dynamics of Bureaucracy; A Study of Interpersonal Relations in Two Government Agencies*, 2nd ed. (University of Chicago Press, Chicago).

Braverman H (1975) *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (Monthly Review Press, New York).

Bucher T (2017) The algorithmic imaginary: Exploring the ordinary affects of Facebook algorithms. *Inform. Comm. Soc.* 20(1):30–44.

Burawoy M (1979) *Manufacturing Consent: Changes in the Labor Process Under Monopoly Capitalism* (University of Chicago Press, Chicago).

Callaghan G, Thompson P (2001) Edwards revisited: Technical control and call centres. *Econom. Indust. Democracy*. 22(1):13–37.

Cappelli P, Conyon MJ (2017) What do performance appraisals do? *Indust. Labor Relations Rev.* 71(1):88–116.

Cardinal LB, Kreutzer M, Miller CC (2017) An aspirational view of organizational control research: Re-invigorating empirical work to better meet the challenges of 21st century organizations. *Acad. Management Ann.* 11(2):559–592.

Chan J, Wang J (2017) Hiring preferences in online labor markets: Evidence of a female hiring bias. *Management Sci.* 64(7).

Chandler AD (2002) *The Visible Hand: The Managerial Revolution in American Business* (Belknap Press of Harvard University Press, Cambridge, MA).

Charmaz K (2006) Constructing Grounded Theory: A Practical Guide through Qualitative Analysis 1 edition. (SAGE Publications Ltd, London; Thousand Oaks, Calif).

Corbin J, Strauss A (2014) Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory 4 edition. (SAGE Publications, Inc, Los Angeles).

Curchod C, Patriotta G, Cohen L, Neysen N (2019) Working for an algorithm: Power asymmetries and agency in online work settings. *Admin. Sci. Quart.* 65(3):644–676.

Danaher J (2016) The threat of algocracy: Reality, resistance and accommodation. *Philos. Tech.* 29(3):245–268.

Davis G (2016) *The Vanishing American Corporation: Navigating the Hazards of a New Economy*, 1st ed. (Berrett-Koehler Publishers, Oakland, CA).

DiMaggio P, ed. (2001) *The Twenty-First-Century Firm: Changing Economic Organization in International Perspective* (Princeton University Press, Princeton, NJ).

Dougherty D (1992) Interpretive barriers to successful product innovation in large firms. *Organ. Sci.* 3(2):179–202.

Dworkin TM (1990) Protecting Private Employees from Enhanced Monitoring: Legislative Approaches. *Amer. Bus. Law J.* 28(1): 59–85.

Edwards RC (1978) The social relations of production at the point of production. *Insurgent Sociol.* 8(2–3):109–125.

Ekman S (2014) Is the high-involvement worker precarious or opportunistic? Hierarchical ambiguities in late capitalism. *Organ.* 21(2):141–158.

Evans JA, Kunda G, Barley SR (2004) Beach time, bridge time, and billable hours: The temporal structure of technical contracting. *Admin. Sci. Quart.* 49(1):1–38.

Feldman MS (1995) *Strategies for Interpreting Qualitative Data* (Sage Publications, Thousand Oaks, CA).

Fincham R (1999) The consultant–client relationship: Critical perspectives on the management of organizational change. *J. Management Stud.* 36(3):335–351.

Gamble J (2006) Multinational retailers in China: Proliferating "McJobs" or developing skills? *J. Management Stud.* 43(7): 1463–1490.

Garfinkel H (1991) *Studies in Ethnomethodology*, 1st ed. (Polity, Cambridge, UK).

Gibbons R, Henderson R (2012) Relational contracts and organizational capabilities. *Organ. Sci.* 23(5):1350–1364.

Gill MJ (2019) The significance of suffering in organizations: Understanding variation in workers' responses to multiple modes of control. *Acad. Management Rev.* 44(2):377–404.

Gillespie T (2010) The politics of "platforms." *New Media Soc.* 12(3): 347–364.

Glaser BG, Strauss AL (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*, 4th ed. (Aldine, New Brunswick, Canada).

Glöss M, McGregor M, Brown B (2016) Designing for labour: Uber and the on-demand mobile workforce. *Proc. 2016 CHI Conf. Human Factors Comput. Systems* (ACM, New York), 1632–1643.

Goodman RA, Goodman LP (1976) Some management issues in temporary systems: A study of professional development and manpower–the theater case. *Admin. Sci. Quart.* 21(3):494–501.

Gouldner AW (1954) *Patterns of Industrial Bureaucracy* (Free Press, Glencoe, IL).

Gray ML, Suri S (2019) *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* (Houghton Mifflin Harcourt, Boston).

Hannak A, Wagner C, Garcia D, Mislove A, Strohmaier M, Wilson C (2017) Bias in online freelance marketplaces: Evidence from TaskRabbit and Fiverr. *20th ACM Conf. Comput. Supported Cooperative Work*.

Haraszti M (1978) *A Worker in a Worker's State* (Universe Publishing, New York).

Heaphy ED (2013) Repairing breaches with rules: Maintaining institutions in the face of everyday disruptions. *Organ. Sci.* 24(5):1291–1315.

Heritage J (1984) *Garfinkel and Ethnomethodology* (Polity Press, Cambridge, UK).

Horton JJ (2010) Online labor markets. Saberi A, ed. *Internet Network Economics*, Lecture Notes in Computer Science (Springer, Berlin Heidelberg), 515–522.

Huising R (2014) The erosion of expert control through censure episodes. *Organ. Sci.* 25(6):1633–1661.

Huising R (2015) To hive or to hold? Producing professional authority through scut work. *Admin. Sci. Quat.* 60(2):263–299.

Irani L (2015) Difference and dependence among digital workers: The case of Amazon Mechanical Turk. *South Atlantic Quart.* 114(1):225–234.

Irani LC, Silberman MS (2013) Turkopticon: Interrupting worker invisibility in Amazon Mechanical Turk. *Proc. SIGCHI Conf. Human Factors Comput. Systems* (ACM Press, Paris), 611.

Jackson SJ (2014) Rethinking repair. Gillespie T, Boczkowski PJ, Foot KA, eds. *Media Technologies: Essays on Communication, Materiality and Society* (MIT Press, Cambridge, MA), 221–240.

Jermier JM, Knights D, Nord WR (1994) *Resistance and Power in Organizations* (Taylor & Frances/Routledge, Florence, KY).

Juravich T (1988) *Chaos on the Shop Floor: A Worker's View of Quality, Productivity, and Management* (Temple University Press, Philadelphia).

Katz L, Krueger A (2016) *The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015* (National Bureau of Economic Research, Cambridge, MA).

Kellogg KC (2009) Operating room: Relational spaces and micro-institutional change in surgery. *Amer. J. Soc.* 115(3):657–711.

Kellogg KC, Orlikowski WJ, Yates J (2006) Life in the trading zone: Structuring coordination across boundaries in postbureaucratic organizations. *Organ. Sci.* 17(1):22–44.

Kellogg K, Valentine M, Christin A (2020) Algorithms at work: The new contested terrain of control. *Acad. Management Annals* 14(1): 366–410.

Kittur A, Nickerson JV, Bernstein M, Gerber E, Shaw A, Zimmerman J, Lease M, Horton J (2013) The future of crowd work. *Proc. 2013 Conf. Comput. Supported Cooperative Work* (ACM, New York), 1301–1318.

Kornberger M, Pflueger D, Mouritsen J (2017) Evaluative infrastructures: Accounting for platform organization. *Accounting Organ. Soc.* 60:79–95.

Kramer RM, Lewicki RJ (2010) Repairing and enhancing trust: Approaches to reducing organizational trust deficits. *Acad. Management Ann.* 4(1):245–277.

Kuhn KM, Maleki A (2017) Micro-entrepreneurs, dependent contractors, and instaserfs: Understanding online labor platform workforces. *Acad. Management Perspect.* 31(3):183–200.

Kunda G (1992) *Engineering Culture Control and Commitment in a High-tech Corporation* (Temple University Press, Philadelphia).

Lee MK, Kusbit D, Metsky E, Dabbish L (2015) Working with machines: The impact of algorithmic and data-driven management on human workers. *Proc. 33rd Annual ACM Conf. Human Factors Comput. Systems* (ACM Press, New York), 1603–1612.

Leung MD (2014) Dilettante or renaissance person? How the order of job experiences affects hiring in an external labor market. *Amer. Sociol. Rev.* 79(1):136–158.

Likert R (1961) *New Patterns of Management* (McGraw-Hill, New York).

Long CP, Burton RM, Cardinal LB (2002) Three controls are better than one: A computational model of complex control systems. *Comput. Math. Organ. Theory* 8(3):197–220.

Marx G, Sherizen S (1986) *Monitoring on the Job: How to Protect Privacy as Well as Property* (MIT Technology Review).

Mayo E (1933) *The Human Problems of an Industrial Civilization* (Routledge, London).

Mazmanian M, Beckman CM (2018) "Making" your numbers: Engendering Organizational control through a ritual of quantification. *Organ. Sci.* 29(3).

McGregor DM (1960) *The Human Side of Enterprise* (McGraw-Hill, New York).

Metiu A (2006) Owning the code: Status closure in distributed groups. *Organ. Sci.* 17(4):418–435.

Meyerson D, Weick KE, Kramer RM (1996) Swift trust and temporary groups. Kramer RM, Tyler TE, eds. *Trust in Organizations: Frontiers of Theory and Research* (Thousand Oaks, CA), 166–195.

Michel A (2011) Transcending socialization: A nine-year ethnography of the body's role in organizational control and knowledge workers' transformation. *Admin. Sci. Quart.* 56(3): 325–368.

Morrison EW, Robinson SL (1997) When employees feel betrayed: A model of how psychological contract violation develops. *Acad. Management Rev.* 22(1):226–256.

Myers KR, Tham WY, Yin Y, Cohodes N, Thursby JG, Thursby MC, Schiffer P, Walsh JT, Lakhani KR, Wang D (2020) Unequal effects of the COVID-19 pandemic on scientists. *Nature Human Behav.* 4:880–883.

Orr JE (1996) *Talking About Machines: An Ethnography of a Modern Job* (ILR Press, Ithaca, NY).

Ottensmeyer EJ, Heroux MA (1991) Ethics, public policy, and managing advanced technologies: The case of electronic surveillance. *J. Bus. Ethics* 10(7):519–526.

Pallais A (2014) Inefficient hiring in entry-level labor markets. *Amer. Econom. Rev.* 104(11):3565–3599.

Pedulla D (2020) *Making the Cut: Hiring Decisions, Bias, and the Consequences of Nonstandard, Mismatched, and Precarious Employment* (Princeton University Press, Princeton, NJ).

Petriglieri JL (2015) Co-creating relationship repair: Pathways to reconstructing destabilized organizational identification. *Admin. Sci. Quart.* 60(3):518–557.

Petriglieri G, Ashford SJ, Wrzesniewski A (2019) Agony and ecstasy in the gig economy: Cultivating holding environments for precarious and personalized work identities. *Admin. Sci. Quart.* 64(1):124–170.

Rahman HA, Barley SR (2017) Situated redesign in creative occupations—An ethnography of architects. *Acad. Management Discoveries* 3(4):404–424.

Ramsay RA (1966) *Managers and Men; Adventures in Industry* (Ure Smith, Sydney, Australia).

Retelny D (2017) Expert crowdsourcing with flash teams and organizations. Doctoral dissertation, Stanford University, Stanford, CA.

Retelny D, Bernstein MS, Valentine MA (2017) No workflow can ever be enough: How crowdsourcing workflows constrain complex work. *Proc. ACM Human-Comput. Interaction*, 1–23.

Rosenblat A (2018) *Uberland: How Algorithms Are Rewriting the Rules of Work* (University of California Press, Oakland, CA).

Rosenblat A, Stark L (2016) Algorithmic labor and information asymmetries: A case study of Uber's drivers. *Internat. J. Comm.* 10:3758–3784.

Russell B (2012) Professional call centres, professional workers and the paradox of the algorithm: The case of telenursing. *Work Employment Soc.* 26(2):195–210.

Roy DF (1959) "Banana time": Job satisfaction and informal interaction. *Human Organ.* 18(4):158–168.

Sachs SE (2019) The algorithm at work? Explanation and repair in the enactment of similarity in art data. *Inform. Comm. Soc.* 23(11): 1689–1705.

Schegloff EA (1992) Repair after next turn: The last structurally provided defense of intersubjectivity in conversation. *Amer. J. Sociol.* 97(5):1295–1345.

Schutz A (1962) *Collected Papers*, vol. 1 (Martinus Nijhoff, Hague, Netherlands).

Sewell G (1998) The discipline of teams: The control of team-based industrial work through electronic and peer surveillance. *Admin. Sci. Quart.* 43(2):397–428.

Shapiro A (2017) Between autonomy and control: Strategies of arbitrage in the "on-demand" economy. *New Media Soc.* 20(8): 2954–2971.

Sitkin S, Cardinal L, Bijlsma-Frankema K (2010) *Control in Organizations: New Directions in Theory and Research* (Cambridge University Press, Cambridge, UK).

Spradley JP (1979) *The Ethnographic Interview* (Holt, Rinehart and Winston, New York).

Stark D, Pais I (2021) Algorithmic management in the platform economy. *Sociologica* 14(3):47–72.

Suchman L, Blomberg J, Orr J, Trigg R (1999) Reconstructing technologies as social practice. *Amer. Behav. Sci.* 43(3):392–408.

Taylor FW (1911) *The Principles of Scientific Management* (Norton, New York).

Taylor P, Bain P (1999) "An assembly line in the head": Work and employee relations in the call centre. *Indust. Relations J.* 30(2):101–117.

Thompson P, van den Broek D (2010) Managerial control and workplace regimes: An introduction. *Work Employment Soc.* 24(3):1–12.

Valentine MA, Retelny D, To A, Rahmati N, Doshi T, Bernstein MS (2017) Flash organizations: Crowdsourcing complex work by structuring crowds as organizations. *Proc. 30th Annual ACM Sympos. User Interface Software Tech.* (ACM, Denver, CO).

Vallas S, Schor JB (2020) What do platforms do? Understanding the gig economy. *Annual Rev. Sociol.* 46(1):273–294.

Werr A, Styhre A (2014) Management consultants—Friend or foe? Understanding the ambiguous client-consultant relationship. *Internat. Stud. Management Organ.* 32(4):43–66.

Zuboff S (1989) *In the Age of the Smart Machine: The Future of Work and Power* (Basic Books, New York).

Zuboff S (2018) *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, 1st ed. (Public Affairs, New York).

Hatim A. Rahman is an assistant professor of management and organizations at Kellogg School of Management, Northwestern University. His research interests are understanding the relationship between new technology and the nature of work and employment relationships in organizations and labor markets.

Melissa A. Valentine is an assistant professor in the management science and engineering department at Stanford University. She conducts field studies to develop new understanding about how new technologies change work and organizations.