

THESIS

HEALTH AND SAFETY IN THE GIG ECONOMY: A QUALITATIVE INVESTIGATION WITH TASKRABBIT WORKERS

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ABSTRACT

HEALTH AND SAFETY IN THE GIG ECONOMY: A QUALITATIVE INVESTIGATION WITH TASKRABBIT WORKERS

Work in the United States is increasingly moving towards contingent positions in the online gig economy, raising concerns about worker health, safety, and well-being in the absence of regulatory frameworks found in traditional employment. The present study examines the health and safety experiences of workers who provide their labor through an online platform called TaskRabbit, which is characterized by gig economy workers who offer freelance labor services to clients, such as cleaning and moving services. Little research has been done with this population; most studies on gig economy workers thus far have focused on on-demand driving companies such as Uber and Lyft. Health risks may arise from little workplace support for physical and mental health. Safety hazards may arise from a lack of training, unregulated physical environments in which tasks take place, and risk of injury due to physical labor. Negative outcomes due to stress may arise from low job control due to algorithmic management (i.e., computerized algorithms that make management decisions based on statistics such as customer approval ratings), and from interpersonal stressors such as incivility (i.e., rude comments, inconsiderate behavior) and unfair treatment. I investigated these potential risks through the use of one-hour, semi-structured qualitative interviews conducted via online video. The interview data was analyzed for recurring themes and sub-themes related to the study topics. The findings provide information on the unique health and safety experiences of the TaskRabbit workforce, which is essential to the development of future quantitative studies and interventions.

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Health and Safety in the Gig Economy: A Qualitative Investigation with TaskRabbit workers

In recent years, workers in the United States have increasingly moved towards accepting non-standard work arrangements, such as jobs found within the gig economy. Thus, “gig” workers are taking on positions with fewer labor standards than what is seen in traditional employment (Bernhardt, 2014; Friedman, 2014). The gig economy, a term first coined by a journalist named Tina Brown, is defined as a field of work characterized by labor or “gigs” provided through online platforms, with independent contractors typically completing the work (Brown, 2017). Brown describes these gigs as standalone projects or consultancies that accumulate to form an individual’s income. The online platforms that host gig workers do not offer the same commitment or benefits as is found in a traditional employment relationship; rather, the platforms serve to merely connect the gig worker with the clients who have work to be done (Donovan, Bradley, and Shimabukuru, 2016; Friedman, 2014). This kind of work has been identified as contingent, meaning that no explicit or implicit contract is involved regarding long-term employment (Bernhardt, 2014). Gig economy work has also been defined as precarious, which means that workers in the gig economy are not protected by the regulations or support found in traditional employment (Benach & Muntaner, 2007). Additionally, gig workers do pay into social security via their income taxes, and because they are independent contractors, they pay twice as much as traditional employees (Mulcahy, 2018). These conditions are noteworthy given evidence that the gig economy may employ as many as 16% of American adults as of 2017 (Board of Governors of the Federal Reserve System, 2017) and is experiencing rapid growth (Bernhardt, 2014).

Services offered on gig economy platforms vary widely. Examples of popular platforms include Uber, Lyft, Fiverr, and TaskRabbit. Some services can be provided online to customers worldwide, such as transcription, programming, writing, and graphic design. Others are provided locally, such as driving services, delivery services, and services involving physical labor. Although features such as flexible hours and low barriers for entry have been presented as benefits for gig workers (Dokko, Mumford, & Schanzenbach, 2015), concerns have also been raised regarding the health, safety, and well-being of these workers (Schwatka et al., 2018; Tran & Sokas, 2017). TaskRabbit, the company that serves as the focus of this study, provides local and in-person labor services. As such, workers on platforms such as TaskRabbit may have different experiences compared to gig workers who exclusively drive or work online.

Scholars have increasingly pointed to potential and significant health and safety concerns for workers within the gig economy due to a lack of resources that are otherwise accessible to traditional employees. Given that gig workers are considered independent contractors by their affiliated organizations and not employees, they are not covered by traditional employment laws (Friedman, 2014; Tran & Sokas, 2017). Thus, gig economy contractors experience uncertainty and a lack of resources that are not present in other industries, such as benefits like health insurance, holiday pay, disability benefits, and workers compensation (Cherry & Aloisi, 2016; Friedman, 2014). Furthermore, because gig workers are employed, they also do not have access to unemployment insurance or other benefits that are provided to many other people who do not have access to benefits through an employer (Cherry & Aloisi, 2016; Friedman, 2014).

Despite these concerns, the gig economy remains under-studied in the occupational safety and health (OSH) literature. Much of OSH research regarding contingent work has thus far addressed temporary workers more broadly, rather than focusing specifically on gig workers

(Howard, 2017). Bajwa, Knorr, Ruggiero, Gastaldo, and Zendel (2018) conducted a literature review of research on the experiences of gig workers and found that only six empirical studies on the topic had been conducted at that point in time. Based on these findings, the authors report that these studies disproportionately focused on workers providing driver services, specifically those affiliated with Uber. Bajwa et al. (2018) has also identified a gap in the literature regarding qualitative research on gig workers. A third review of the gig economy literature, focusing on implications regarding human-computer interactions, indicated a gap in the literature regarding safety issues (Dillahunt et al., 2017). Furthermore, researchers have stated that existing research on the gig economy is insufficient, in that the variety of experiences of gig workers between different platforms has not been captured (Bajwa et al., 2018; Kalleberg & Dunn, 2016).

Gig workers may be a high-risk population for health and safety issues for a number of reasons. These issues include exposure to unsafe environments through hazardous agents and ergonomic risks and a lack of protective initiatives such as training and benefits, as well as exposure to psychological stressors. Because gig workers are affiliated with companies, they do not have the freedom to set their own work contract parameters in the same way as other independent contractors, raising concerns about how these work conditions may impact their well-being (Tran & Sokas, 2017). Although the lack of benefits is common for other independent contractors, such as independent service providers like plumbers and freelance writers, gig economy contractors face additional constraints beyond what is experienced by other independent contractors, such as low control over work hours and low pay (Kalleberg & Dunn, 2015; Wood, Graham, Lehdonvirta, & Hjorth, 2018). Furthermore, gig workers are managed not by human supervisors, but rather are subject to algorithmic management, or computerized algorithms that make management decisions (e.g., work assignments, performance evaluation)

based on statistics such as customer approval ratings (Lee, Kusbit, Metsky, & Dabbish, 2015). The potentially difficult working conditions within the gig economy, combined with the lack of support via employment laws or by the companies through which gig workers provide their labor, indicate that gig workers are a high-risk population for health and safety issues.

Present Study

Given the poorly regulated work environments that gig workers operate in, researchers must develop a better understanding of how contractors participating in the gig economy experience health and safety risks in their work. In the current study, I focus on TaskRabbit over other companies because TaskRabbit is unique in that workers perform a wide variety of tasks, which often involve physical labor (TaskRabbit, Inc., 2019c). I conducted an exploratory, qualitative study by interviewing TaskRabbit workers, or “taskers”, to gain rich and detailed knowledge about their health, safety, and well-being experiences. More specifically, I investigated how TaskRabbit workers experience and navigate the physical and mental health risks, safety risks, and work-related stress they experience in their work.

TaskRabbit is not the only company that allows contractors to offer a variety of labor services to clients, but I chose to focus on TaskRabbit above other companies for a number of reasons. First, TaskRabbit is the largest company through which workers offer local, in-person labor services, with about 140,000 workers on the network as of 2018 (TaskRabbit, Inc., 2018b). Other online applications such as Wonolo and Moonlighting share some similarities with TaskRabbit, but they are not similar enough to be considered for inclusion in the present study (see Brustein, 2019; Moonlighting LLC, 2019). Other online platforms such as Bellhops, Handy, and TaskEasy offer a single type of service that is also available through TaskRabbit (moving, home repairs, and lawn mowing, respectively), but have significantly fewer contractors and do not offer the wide variety of services as seen on TaskRabbit (Bellhops, Inc., 2019; Handy, Inc., 2019; TaskEasy, Inc., 2019).

Although I had initially chosen to work with taskers for my study in 2019, I did not anticipate that the precarious nature of their work would be made even more salient by the

impending COVID-19 pandemic. The fact that this study occurred during a pandemic is an important contextual factor to consider because the situation may have been experienced differently by gig workers compared to traditional employees. For example, Spurk & Straub (2020) pointed out that gig workers who lost work during the pandemic were not formally fired, and therefore were not able to collect unemployment, but were also not given any alternative work options. Drivers on the Uber platform have also been reportedly faced with plummeting pay rates as a result of the pandemic (Katta et al., 2020). Like other essential workers who were allowed to continue working during, gig workers who did find jobs faced the risk of contracting COVID-19 through increased contact with other people (Katta et al., 2020; Spurk & Straub, 2020). I made efforts to address the COVID-19 pandemic in my study by asking questions about how the pandemic has impacted taskers' work.

Study Contributions

By focusing on TaskRabbit workers, this study makes three important contributions to the literature. First, this study evaluates how taskers navigate health risks, safety risks, and stressors in their work. I also investigated taskers' beliefs in terms of who they think is responsible in the event of an injury (i.e., themselves, their company, or clients) to further examine their perceptions of TaskRabbit's role in their health and safety experiences. A small number of studies have involved investigations of taskers' experiences (see Dunn, 2020; Hannák et al., 2017; Ravenelle, 2016; Ravenelle, 2017; Schor et al., 2020; Schor, 2017; Thebault-Spieker et al., 2015), but the findings of these studies have largely been limited to job-related topics outside of occupational health and safety. Because the population is not yet studied in OSH research, the results of the study add to our current understanding of an emerging workforce through the exploration of a new and unique population within the gig economy. For

practical purposes, this study raises awareness of the unique conditions of these workers. Furthermore, the gathered information is crucial to the development of recommendations that are specific and relevant to the tasker population. Any general recommendations for gig workers may otherwise not be applicable to taskers, which is concerning given the evidence that they are a high-risk population for health and safety hazards.

The study's second contribution is expanding the development and usage of the Total Worker Health™ (TWH™) approach to the integration of health and safety protection and promotion initiatives to the tasker population. The TWH™ approach, created by the National Institute for Occupational Safety and Health (NIOSH), is defined as “policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being” (NIOSH, 2018). Scholars have called for more TWH™ research on the changing structure of work seen in the United States, including contingent work (Baron, Tsui, Curevo, & Islam, 2019). More specifically, researchers have identified a need to conduct TWH™ research on gig workers, given their high levels of vulnerability to health and safety hazards (Schwatka et al., 2018; Tran & Sokas, 2017). To date, there have not been any studies about the health and safety conditions of gig economy workers that use the TWH™ approach.

Although it was not initially planned before conducting this study, a third contribution that emerged from the qualitative data is the importance of taskers' work-related boundaries and personal identities in their health, safety, and stress experiences. Task boundaries refers to a series of decision points that taskers make when deciding how to do tasks. These task boundaries appear to play a role in shaping the health, safety, and stress-related risks that taskers encounter on the job. How taskers enforce boundaries, why they enforce them, and why they choose not to

enforce them are also discussed. In addition, there appears to be several individual differences that play a similar role in taskers' experiences. These identities include those related to physical attributes as well as external life situations. These findings provide important contextual information on how the tasker experience can be very different from person to person, and also provides further direction for future research.

Research Questions. The present study aims to answer three research questions related to tasker health and safety to address current gaps in the OSH research, with all broadly focusing on tasker well-being. Well-being is a concept encompassing not only the absence of adverse health and safety conditions, but also a state of experienced quality of life, particularly with respect to work (DeJoy & Wilson, 2019; NIOSH, 2016). My first research question is “How do taskers experience health in connection to their work?” My second research question is “How do taskers experience safety in connection to their work?” My third research question is “How do taskers experience stress in connection to their work?” My research questions were broad and open-ended, allowing for participants to provide information on their unique experiences.

In order to provide sufficient context for the present study, I must address past literature on relevant topics. In the remainder of the introduction, I first identify gaps in the current OSH literature regarding taskers and why those gaps are of concern to OSH researchers. Then, I introduce the TWHTM approach and explain how it provides appropriate guidance for the current study. I then integrate the approach into my three main research topics: tasker health, tasker safety, and tasker stressors. These sections also include reviews of past literature to provide background and highlight the need for further research related to how taskers experience health and safety risks in their work.

TaskRabbit Workers: An Underrepresented Population in OSH Research

TaskRabbit is a company of increasing notoriety given its recent, rapid growth. Founded in 2008 by Leah and Kevin Busque, the startup has since been acquired by IKEA in 2017 (TaskRabbit Inc., 2018; Rao, 2016). The company has experienced dramatic growth, having reported a 300% increase in revenue within 2016 (Rao, 2016). Currently, an estimated 140,000 workers participate in the platform across 45 major American cities and 10 major cities in the United Kingdom (TaskRabbit Inc., 2018b; TaskRabbit Inc., 2019b). In order to join the TaskRabbit platform as a worker in the U.S., applicants must be 18 years of age and have a U.S. Social Security number in order to pass a background check (TaskRabbit Support, 2019). According to TaskRabbit Inc. (2019b), 60% of workers on the platform are millennials, which refers to an age range from 23 to 38 as of 2019 (Pew Research Center, 2019).

Despite TaskRabbit Inc.'s increasing notoriety, the body of research on the company's workers is relatively small. To my knowledge, two studies thus far have involved interviewing taskers exclusively, although neither focused on health and safety. One study involved interviewing taskers in the Chicago metropolitan area to see if the geographic location of tasks impacted their decision to accept the task, along with their requested levels of pay for that task (Thebault-Spieker et al., 2015). Another study involving taskers focused on identifying the socio-economic characteristics of people who choose to work for TaskRabbit (Schor, 2017).

A small number of studies have also involved interviewing gig workers across a variety of platforms, including TaskRabbit. A qualitative interview study series has been conducted on gig workers, including a subset of TaskRabbit workers (Ravenelle, 2016; Ravenelle, 2017), to investigate whether gig workers thought of themselves as entrepreneurs or members of a precarious workforce. Schor et al. (2020) conducted interviews with workers from seven

different platforms to examine differences in dependency on the platform, autonomy, job satisfaction, and earnings. In addition, Dunn (2020) interviewed gig workers including taskers to create a typology based on worker motivations and intentions to participate on the platform temporarily versus permanently. Again, none of these studies focus on health and safety directly.

In addition to research involving interviews, researchers have also investigated the TaskRabbit platform in other ways. For example, Hannák et al., (2017) investigated the potentiality for differences in pay between demographic groups by examining relationships between physical appearances on taskers' profiles and their requested levels of pay. The authors found that African American males were consistently paid less and were offered fewer jobs than members of other groups. Other researchers have explored the economic impact of TaskRabbit's presence on local housekeeping industries (Gao, Cheng, & Pavlou, 2019). In summary, previous studies about TaskRabbit are based on a range of research questions, but none specifically address health and safety concerns for taskers.

The lack of research on taskers is concerning given that they perform more diverse tasks than gig workers in other companies which have been studied more extensively, such as Uber drivers and Airbnb hosts (Sutherland & Jarrahi, 2018). On platforms like Uber and Airbnb, workers specialize in a single type of service, namely driving and hosting services (Uber, Inc., 2019; Airbnb, Inc., 2019). Other services such as DoorDash and Amazon Mechanical Turk likewise offer specialized labor to customers, such as deliveries or services provided over the internet. Taskers, in contrast, can accept vastly different tasks over a range of work categories (TaskRabbit Inc., 2018b). The variety of tasks that can be performed, for which the tasker oftentimes must be physically present at specified locations, is a unique feature of in-person

labor apps compared to previously studied populations such as on-demand drivers from Uber and Lyft (see Bajwa et al., 2018 and Sutherland & Jarraji, 2018 for reviews).

As mentioned, taskers offer a variety of freelance labor services to clients on the TaskRabbit platform. These tasks are arranged into 45 overarching categories (TaskRabbit Inc., 2018b). Examples of these categories include furniture assembly, minor home repairs, and deliveries (TaskRabbit, Inc., 2018b). Taskers typically perform small jobs commonly thought of as chores, such as conducting home repairs, moving furniture, assembling IKEA furniture, performing cleaning services, and waiting in line. However, little restraints are placed on what kinds of tasks can be posted, so relatively unorthodox requests can also be made, such as rushing passports to the airport, or retrieving keys from the bottom of a lake (TaskRabbit Inc., 2019c; TaskRabbit Inc., 2019a). These tasks may pose a number of potential risks to taskers. For example, many tasks involve physical labor, such as lifting heavy objects like furniture or affixing heavy objects to walls. The Occupational Health and Safety Administration (OSHA) (n.d.) has identified these actions as risk factors for bodily injuries and musculoskeletal disorders. Furthermore, risks may arise from the fact that taskers may not be adequately trained to perform the work they are doing. They also may not have the best tools or equipment to perform jobs safely, or sufficient personal protective equipment (PPE) to protect from environmental hazards. These dangers that taskers may face are not yet explored in the OSH literature.

Total Worker Health™

The variety of tasks and subsequent health and safety risks experienced by taskers warrants an OSH investigation of the TaskRabbit workforce. As such, this study's research questions are based on the TWH™ approach to OSH research. According to the TWH™

approach, health and safety protection and promotion initiatives can be integrated into comprehensive programs that are more effective in improving health and safety outcomes than if they were implemented individually (NIOSH, 2012; Sorensen et al., 2013). Health and safety protection initiatives are thought of as efforts to ensure that workers are kept safe from harm arising from their work (NIOSH, 2016). Promotion initiatives, on the other hand, involve efforts to go beyond protecting worker health and safety, instead focusing on optimizing worker well-being (DeJoy & Wilson, 2019). Integrated approaches to addressing these issues involve combining related protection and promotion policies to both protect workers and promote their well-being. For example, an integrated approach may be characterized by simultaneous efforts to remove risks of exposure to toxic fumes in the work environment, while also providing workers with education and resources to discourage smoking to support their respiratory health. See Appendix 2 for a list of issues relevant to TWH™ and an explanation for which are relevant to the current study.

Indeed, the effectiveness of TWH™ interventions for improving health and safety outcomes has been shown to have empirical support (see Anger et al., 2019; Anger et al., 2015; Feltner et al., 2016 for reviews). However, evidence of the superiority of integrated versus independently administered approaches remains lacking in the TWH™ literature (Anger et al., 2019; Anger et al., 2015). That said, the current literature indicates that TWH™ interventions that have been conducted thus far have been effective in improving health, safety, and well-being outcomes, indicating that the approach is promising and warrants further use and investigation (Anger et al., 2019; Anger et al., 2015; Feltner et al., 2016).

Built into TWH™ is the idea that workers face health and safety issues that transcend the boundaries of work and home, and TWH™ interventions should therefore consider the context

of workers' nonwork lives in relation to their work (Tamers et al., 2019). An example of this is an intervention that involves ergonomic assessments on the job while simultaneously promoting increases in physical activity outside of work (Sorensen et al., 2013). Because of the versatility demonstrated by this holistic strategy, the TWH™ approach has the capacity to adapt to changing workforces, such as increasing numbers of contingent workers (Tamers et al., 2019).

TWH™ and Gig Workers. Contingent work has been identified as a growing work arrangement for which TWH™ research is needed (Tamers et al., 2019). TWH™ researchers have acknowledged that gig workers have little access to health and safety resources due to the precariousness of their work arrangements (Schwatka et al., 2018; Tran & Sokas, 2017). As such, gig workers are given the primary responsibility for their own health and safety, yet oftentimes have limited knowledge on how to protect their own health and safety (Howard, 2017; Schwatka et al., 2018). This is especially concerning given that relying on individual workers' behaviors to protect their own health and safety has been deemed ineffective in many OSH professions (Schill, 2017). Schwatka and colleagues (2018) suggest that external resources, such as community support and education, may be of particular importance to this population.

TaskRabbit Worker Health

Health has been defined by the World Health Organization (2019) as the absence of disease and other adverse health conditions combined with a state of physical, mental, and social well-being. Relatedly, the "health" component of TWH™ focuses on an integration of health protection and illness prevention efforts, in addition to health promotion efforts (NIOSH, 2018; Schill, 2017). Protection efforts include limiting long work hours, controlling environmental health risks, and providing workers with access to compensation and benefits, such as workers' compensation, health insurance, adequate pay, and paid time off (Schill & Chosewood, 2013;

Schill, 2017). Health promotion efforts include encouraging healthy behaviors, such as physical activity and pursuing work-life balance (Schill & Chosewood, 2013). Researchers in support of the TWH™ approach advocate for the combination of these various tactics with the encouragement of healthy behaviors to pursue a holistic approach to protecting and promoting worker well-being (NIOSH, 2018; Sorensen et al., 2013). TWH™ researchers have identified contingent work, such as gig work, as a high-risk population for health issues, warranting further research (Schwatka et al., 2018; Tamers et al., 2019).

The TWH™ approach appears to be highly applicable to gig workers considering the high prevalence of health risks they may face in their work. Broadly speaking, numerous researchers have pointed to an increased prevalence of health risks in contingent or precarious employment compared to traditional employment (Cummings & Kreiss, 2018; Mullins, 2018; Howard, 2017). Additionally, Davis and Hoyt (2020) found that workers whose pay is directly linked to the quantity of goods they produce may experience poorer health outcomes, which they suggest is analogous to the performance-based pay systems found in the gig economy. Furthermore, researchers conducting a study of on-demand rideshare drivers found that participants reported more low back pain, neck pain, and knee pain compared to the general population (Caban-Martinez et al., 2020). They also found that the amount of time spent driving was associated with increased musculoskeletal pain. However, TaskRabbit workers perform different types of labor than drivers, including physical labor, and their work may be more varied and thus requires less repetitive motion. As such, the experiences of TaskRabbit workers in relation to pain remains unexplored.

Health Protection. The comparatively poor health conditions for contingent workers may be due to the failure of gig economy platforms to provide workers with resources related to

health protection. Like other companies in the gig economy, TaskRabbit does not provide any benefits to its workers, such as health insurance, workers' compensation, or paid time off (TaskRabbit, Inc., 2018a). Therefore, no regulatory framework for health protection exists for taskers since no such protection is provided by the employer.

Health risks to taskers due to a lack of health protection initiatives may also extend to issues related to sleep. The absence of a regulatory framework for work hours may lead to longer and more irregular work hours (Baron et al., 2019). These conditions may lead to sleep restriction, which is the reduction of time spent in bed to suboptimal levels (Banks & Dinges, 2007). TaskRabbit does not appear to have any regulations set in place to limit the number of hours that can be worked by a tasker.

The mental health of taskers may also suffer from a lack of protection initiatives made by their company. Some mental health outcomes that TWHTM researchers have identified as related to work include depression, anxiety disorders, suicide, and burnout (LaMontagne et al., 2019). Burnout refers to a point of severe exhaustion, detachment, and cynicism experienced by a worker after prolonged exposure to chronic stress (Maslach, Schaufeli, & Lieter, 2001). Additionally, TWHTM researchers assert that the optimal approach to addressing worker mental health is eliminating work-related risk factors that threaten mental well-being (LaMontagne et al., 2019). An example of a commonly used protection effort designed to prevent the progression of mental health problems is employee assistance programs (Page et al., 2013), which are employer-funded resources provided to employees for issues such as work stress (Kirk & Brown, 2013). This type of service is not currently provided by TaskRabbit.

Health Promotion. In addition to the lack of health protection, gig economy platforms may be unsuccessful in promoting worker health by failing to encourage healthy behaviors for

taskers. These healthy behaviors may be difficult for taskers to pursue given the need to consistently manage the irregular scheduling of their work. Broughton et al. (2018) reports that gig workers have reported feelings of reluctance to invest time in activities like exercise to support their health, at the risk of missing out on jobs during time away from the computer. Taskers may face this issue because they often need to respond to job assignments quickly in order to secure them (Ravenelle, 2017). This pressure to manage work during non-work time may also inhibit taskers' willingness to engage in social interactions with family and friends (see Wood et al., 2018), which is important for individual well-being (Kuntz, 1990). This is partially evidenced by reports from Uber drivers that they have missed out on social events in favor of working due to unignorable financial incentives (Malin & Chandler, 2017). These conditions reveal the potential for companies like TaskRabbit to provide suggestions and encouragement to balance work tasks with healthy activities, both on the job and outside of work. However, it is unclear whether TaskRabbit has taken such initiatives.

Conclusion. To investigate these potential health risks, I asked broad and open-ended questions allowing for interviewees to express their unique perceptions of which health concerns are the most salient in their work. Participants were also asked about existing health protections in their work, such as health risk exposures in their work and access to benefits like health insurance. In terms of promotion efforts, I asked taskers about how their health is supported by their TaskRabbit work, how they go about taking breaks, and their ability to pursue non-work activities like exercise and social interactions.

TaskRabbit Worker Safety

OSHA (N.D.) identifies a safe worker as someone who not only has not been injured on the job, but also operates in an environment that is free of safety hazards. As such, the TWH™

approach advocates for the integration of safety protection initiatives with promotion efforts to better ensure a safe working environment (Schill & Chosewood, 2013). More specifically, OSHA defines recordable injuries as any adverse condition that requires medical treatment beyond first aid, or results in days away from work, restricted work, or transfer to another job (OSHA, N. D.). However, for the purposes of the present study, I am also interested in injuries that only require first aid, and/or do not necessarily impede work. The prevention of workplace injuries not only includes prevention of actual injuries, but also accidents and near-misses (Jones, Kirchsteiger, & Bjerke, 1999). Jones et al. (1999) define accidents as instances in workplaces where injuries or property damage has occurred. Near-misses are defined as events where no injuries or property damages took place, but a slight variation in the chain of events could have resulted in those negative outcomes (Jones et al., 1999; National Safety Council, 2019). The investigation of incidences and near-misses can allow for the collection of more information on potential safety hazards than by investigating injuries alone through the identification of additional circumstances where the risk for injury was significant (Jones et al., 1999).

Safety Protection. The lack of support and regulations found in gig work suggests that there is also a lack of protection for from safety risks, which range from physical and biological agents to ergonomic risks. Minimal efforts to protect worker safety are seen in the TaskRabbit platform, as indicated by the company's website. TaskRabbit's Happiness Pledge Terms, found in the company's terms and conditions, state that TaskRabbit is not responsible for the bodily injury of taskers due to instances such as those arising from equipment provided by clients, intentional acts such as physical assault, and what is considered a "natural result of the Task undertaken" (TaskRabbit Inc., 2018a). Therefore, any information on how often and how severely TaskRabbit employees are injured or exposed to hazards on the job are unknown, given

that they are not provided with the means to report their injuries or instances of hazard exposure. This is especially concerning given that taskers often perform physical labor, such as moving heavy furniture, which presents a risk for physical injury (OSHA, n.d.). Heavy lifting, and particularly repeated heavy lifting, has been identified as a significant risk factor for musculoskeletal injury, including spinal injury (Pope, Goh, & Magnusson, 2002). Additional physical hazards in tasker work may include exposure to heat and cold, electrical hazards, falls, chemicals, and transportation hazards.

Another important consideration in terms of ergonomic risks is that taskers may often perform lifting tasks alone, which would otherwise be performed by a team of workers. A difference between TaskRabbit and contractors for similar companies, such as moving companies, is that TaskRabbit workers are hired individually, and therefore may often be working alone. This is a potential concern because it is considered unsafe to move some heavy objects without a partner. OSHA (N.D.) recommends that two or more people should work together to lift objects that weigh more than 50 pounds. Objects that taskers may need to lift could exceed that amount, such as couches and other furniture. Other factors may increase the relative danger of lifting furniture and other objects, such as how often the worker is lifting an object and for how long (OSHA, 2015). An additional factor is that furniture often rests on the floor and therefore has a low point of origin for the lift, which also increases the level of danger involved (OSHA, 2015). Taskers who are hired alone may be asked to move objects that are too heavy for them to lift safely by themselves, putting them at risk for musculoskeletal injuries.

The lack of protection efforts initiated by TaskRabbit is particularly apparent in terms of regulations for equipment including PPE usage for taskers. The TWHTM approach specifies that employers should provide PPE when necessary to shield workers from safety hazards such as

physical agents, chemicals, and biological agents (NIOSH, 2018; NIOSH, 2016), which is a practice not seen on the TaskRabbit platform. TaskRabbit does not provide PPE or any other equipment to taskers, and instead places responsibility on taskers to invest in and use PPE on their own (TaskRabbit, Inc., 2019d). When it comes to encouraging taskers to use PPE, TaskRabbit's efforts appear mostly limited blog posts that suggest that taskers often use PPE in particular circumstances (see TaskRabbit, Inc., 2018d). Concerningly, researchers have reported that workers are less likely to use PPE if it is not provided by employers (Hinkin, Gammon, & Cutter, 2008). Furthermore, a lack of knowledge has been shown to have a negative impact on PPE usage (Kermode et al., 2005; Sax et al., 2005). TaskRabbit does not provide any training or educational materials to its workers on how to properly use PPE, or incentives for proper usage, which may place taskers at higher risk for exposure to safety hazards. As an added concern, risk for injury may arise from the unregulated use of tools by taskers, as indicated by TaskRabbit denying any responsibility for such injuries in its terms and services (TaskRabbit, Inc., 2018a).

Safety Promotion. TaskRabbit's potentially inadequate safety climate may provide further evidence for a lack of safety promotion initiatives. This may be seen through minimal effort on the company's part to encourage safe behaviors. Safety climate, or perceptions of how safety is managed in an organization, has been shown to relate to safety outcomes (Casey et al., 2017). Perceptions of safety climate may differ between gig workers due to variability in training, dangers associated with their work, and perceptions of safety practices (Howard, 2017). The lack of incentives to engage in safe behaviors put in place by TaskRabbit (TaskRabbit, Inc., 2019d) may result in insufficiencies in the company's safety climate in promoting workplace safety. Such incentives may include praise, small gifts, or monetary compensation for attending meetings, providing suggestions for improving work safety, and engaging in other pro-safety

behaviors (Goodrum & Gangwar, 2004). Furthermore, the ambiguity found in gig work in terms of who is responsible for compliance with health and safety standards may result in further risk for occupational injury (NIOSH, 2015). TaskRabbit could promote workplace safety by providing incentives for taskers to communicate ideas to supervisors about how to improve workplace safety. However, it seems unlikely that such efforts are currently in place given that taskers appear to have no direct communication with any kind of supervisors.

Conclusion. Safety issues for taskers may arise from ergonomic hazards, exposures to harmful agents, and other risks for exposure found in the wide variety of work environments experienced by taskers. Thus, the need to find out how taskers experience these risks is apparent. In addition to whether participants have ever been injured on the job, I asked questions that also allowed participants to recount any experiences they have had with workplace accidents, incidents, or near-misses. I also posed questions to taskers about how they chose to navigate those situations in terms of prioritizations of safety and work. Finally, I asked taskers to identify indicators of safety climate, such as PPE usage, in their work situation.

TaskRabbit Worker Stressors

NIOSH (1999) has defined stress as negative physical and emotional responses to job requirements that contradict workers' needs and/or capabilities, which can result in health risks. Kahn and Byosiere (1992) defined stressors as undesired physical, physiological, or psychological conditions, and strain refers to the adverse emotional and physical symptoms resulting from said stressors. Likewise, the TWHTM approach identifies human factors and psychosocial stressors as occupational health risks (NIOSH, 2018; Schill, 2017). This is because prolonged exposure to stressors has been linked to long-term, negative health outcomes for workers, such as elevated cholesterol, high blood pressure, and coronary heart disease (Kahn

&Byosiere, 1992). Furthermore, stress researchers have pointed out that job stressors vary across different occupations (Kahn & Byosiere, 1992). This indicates a need to have open communication about stressors with workers in occupations that differ from previously studied jobs, such as taskers.

Interpersonal Stressors. Sources of strain for taskers may arise from interpersonal interactions. As indicated by workers in the on-demand driving industry, gig workers experience continuous interactions with clients that may lead to emotional exhaustion (Malin & Chandler, 2017), which refers to feelings of emotional depletion and overextension resulting from job demands (Wright & Cropanzano, 1998). Stressors may also include those arising from workplace incivility, which is defined as the contradiction of workplace norms for respect by behaving inconsiderately towards other individuals in the workplace (Andersson & Pearson, 1999). Acts of workplace incivility have been linked to increased levels of psychological distress in employees (Cortina, Magley, Williams & Langhout, 2001; Lim & Cortina, 2005). Gig workers who provide their services through on-demand driving platforms have reportedly experienced acts of incivility perpetrated by customers (Anderson, 2016; Malin & Chandler, 2017). However, taskers' experiences with incivility are currently unexplored in the OSH literature.

Perhaps even more concerning than acts of incivility is risk for increased exposure to sexual harassment. Sexual harassment has been reported to result in experienced strain for female workers (Crull, 1982; Lim & Cortina, 2005), although the same feelings of strain can be experienced by individuals with other gender identities as well. Researchers have suggested that working in clients' homes specifically may result in isolation that places workers at higher risk for sexual harassment (Barling, Rogers, & Kelloway, 2001). Additionally, Ravenelle (2019a) asserts that the fact that gig workers, including taskers, often have to enter clients' homes may

make it more difficult for them to identify situations that are inappropriate and equate to sexual harassment, due to the ambiguity that comes with interacting with clients' private living spaces.

TaskRabbit does not currently have any regulations in place to protect workers from interpersonal stressors. The TaskRabbit Happiness pledge specifically states that TaskRabbit is not responsible for any losses or damages arising from intentional acts, which include but are not limited to interpersonal violence, sexual assault or abuse, identity theft, or fraud (TaskRabbit, Inc., 2018a). Furthermore, it is unknown to researchers whether TaskRabbit provides any training related to interpersonal stressors such as sexual harassment. These conditions contradict the TWHTM philosophy that workplaces should implement prevention efforts directed specifically at the reduction of job stressors (LaMontagne et al., 2019).

Algorithmic Management Stressors. The algorithmic management experienced by taskers has been identified as another potential source of strain for gig workers (Hooker & Kim, 2019; Jhaver, Karpfen, & Antin, 2018; Broughton et al., 2018). As such, algorithmic management relates to the TWHTM-related concept of management commitment to protecting and promoting worker health and safety (Schill & Chosewood, 2013), which may be negatively impacted by a lack of communication between managers and contractors. The fact that gig workers often do not have open communication with upper management suggests that taskers do not have open communication with supervisors when it comes to decisions made by the company. Additionally, researchers have suggested that a lack of communication with supervisors may contribute to experienced role ambiguity for workers (Johlke & Duhan, 2000; Brunetto, Farr-Wharton, & Shacklock, 2011).

Taskers may also feel a lack of stability in their income due to algorithmic management. Taskers' job acceptance rates and level of pay are both impacted by their approval ratings on the

TaskRabbit app, and workers in other gig economy platforms have identified their ratings as a source of strain (Anderson, 2016; Ravenelle, 2015). Since taskers' approval ratings are determined by clients, the strong impact of approval ratings on work hours and pay may result in low feelings of control over their work (Wood et al., 2018).

In addition, taskers may experience strain from ambiguity regarding the timing of their work hours. Low control over work hours has been identified as a source of strain for workers (Hackman & Oldham, 1976). The relative unpredictability of gig economy work hours compared to other positions with regular scheduling may contribute to increased strain for gig workers (Wood et al., 2018). However, research has indicated that gig workers often feel that they have a high amount of control over their hours (Hooker & Kim, 2019; Lehdonvirta, 2018), indicating that work hour flexibility may actually be a valuable resource in gig work. Indeed, taskers report flexibility as a main reason for joining the platform (TaskRabbit, Inc., 2018b). Nevertheless, gig workers have reported constraints over the timing of their work hours, such as client availability and competition for jobs (Lehdonvirta, 2018; Malin & Chandler, 2017). TWHTM researchers also suggest that work shifts should be scheduled during daytime hours when possible, and 10 to 15-minute breaks should be taken once an hour to reduce health risks, such as work strain (Caruso, 2019). Although taskers schedule their own shifts without influence from TaskRabbit, the company nevertheless has the opportunity to encourage workers to practice healthy shift scheduling. It is unclear whether TaskRabbit provides this information to taskers, aside from some suggestions from informal blog posts (see TaskRabbit, 2018). This potentially complex and nuanced role of work hour flexibility appears to be worth exploring for the tasker population.

Conclusion. In summary, taskers may experience strain as a result of interpersonal interactions and algorithmic management. In light of these potential issues, I asked taskers about

their interpersonal stressors at work, and how they chose to navigate situations at work involving those stressors. This process included questions on how taskers go about deciding whether or not to follow through with a task if they are faced with both minor and more serious interpersonal stressors. I asked participants about their interactions with the TaskRabbit platform and algorithmic management and how those interactions impact their feelings of strain.

Methods

Participants

For the proposed study, all participants were at least 18 years of age, had an active tasker profile, and had worked at least 10 tasks per month in the past three months (prior to the COVID-19 outbreak). Taskers in all categories of work were accepted. Participants sometimes had other jobs or sources of income aside from their work as a tasker, which did not result in exclusion from the study. Prior to the scheduling of their interviews, I asked prospective participants to confirm via email that they fit these inclusion criteria. During the interviewing process, I also asked specific questions about the inner workings of the TaskRabbit app, such as how the three rating systems work, to collect evidence in support of the participants being genuine taskers.

I aimed to conduct 30-60 interviews with taskers and achieved a final sample size of 34. Of these participants, 22 identified as female and 12 identified as male, with no other gender identities mentioned. Participants' ages ranged from 24 to 56 ($M=37.39$, $SD=8.24$). Eighteen of the participants identified as Caucasian, six identified as Asian, five identified as African American, four identified as Hispanic/Latino, and one identified as East Indian. Most of the participants had bachelor's degrees ($n = 18$), seven had associate degrees or some college, two went to technical school, two had high school diplomas, one had a GED, and two had graduate degrees. Fourteen of the participants lived in California, six lived in New York, three lived in Illinois, two lived in Texas, one lived in Virginia, one lived in Massachusetts, one lived in Nevada, one lived in New Jersey, one lived in Ohio, and one lived in the Washington DC metropolitan area.

On average, participants had worked for TaskRabbit for two years ($SD = 19.11$ months) with hours worked per week ranging from four to over 40. Numbers of tasks worked per week ranged from three to more than 20. The most popular categories of tasks performed were cleaning ($n = 14$), organizing/de-cluttering ($n = 11$), miscellaneous errands ($n = 11$), computer tasks ($n = 10$), moving ($n = 9$), building/Ikea assembly ($n = 9$), shopping/delivery ($n = 9$), and home repairs ($n = 7$), although numerous other categories were also mentioned. It should also be noted that the vast majority of participants performed more than one category of tasks. Out of the 34 participants, 31 had other responsibilities outside of TaskRabbit, including other jobs, working through other gig companies, independent business development, various types of freelancer work, and caregiving responsibilities. None of the participants reported that they were taking classes in addition to their TaskRabbit work. In terms of finances, participants made an average hourly rate of \$39.72 ($SD = \27.31) and an average monthly income of \$1,790.24 ($SD = \$1,257.50$) from TaskRabbit. Participants reported an average annual income of \$18,147.83 ($SD = \$15,489.55$) from TaskRabbit alone, and an average net income of \$40,000 ($SD = \$23,578.08$) from all of their jobs. The average gross household income was \$68,948 ($SD = \$38,043.05$). Of the 33 participants who reported whether they had health insurance, 11 said they have a private healthcare provider, 10 had no insurance, six had insurance through their spouse's provider, three had insurance through another employer, and three had government-provided health care. In response to a question assessing financial precarity, 10 out of the 30 participants who responded stated that they would experience financial difficulty if they were faced with a sudden emergency and had to come up with \$400.

The 34 interviews that I conducted were enough to demonstrate saturation of the data. Saturation refers to the point at which the further collection of data (i.e., additional interviews)

does not seem to contribute any more theoretical benefit beyond what has already been recorded (Strauss & Corbin, 1998). This can be determined by coding the interviews as they are recorded and noting the point at which a minimal amount of additional codes is generated from additional interviews (Guest, Bunce, & Johnson, 2006; Saldaña, 2016). Although more interviews would have contributed to the robustness of the data, the number of interviews must be kept to a manageable number given the richness and detail of the data and the need to conduct analyses on each interview with an appropriate level of depth (Ritchie et al., 2014).

Procedure

Participants were recruited through a number of methods. To encourage participation, I offered participants \$40 per one-hour interview, which corresponds with average payment for tasks on the TaskRabbit platform. I also created a Google Sites webpage to host information about my study. I utilized a number of recruitment strategies, including social media posts, a paid screening survey on Amazon Mechanical Turk, paid online advertising, paper flyers posted in the Denver metropolitan area, and snowball sampling techniques. See Appendix 5 for a more comprehensive explanation of each recruitment strategy, as well as a breakdown of which were the most effective.

I conducted a pilot study to finalize the interview protocol (see Appendix 1 for the final protocol) and then interviewed participants for the study. Interviews were conducted through an online video chat meeting on Zoom, a widely used online video chat application. Before we began the interview, I walked each participant through an electronic copy of the consent form and obtained verbal consent. A relatively consistent interview protocol was implemented across all iterations of the interviewing process, with the exception of some minor additions. Interview times ranged from roughly 20 minutes to 70 minutes, with most lasting 50 minutes to one hour.

The interviews were recorded using Open Broadcaster Software, a free video-recording service, and transcribed verbatim with the use of Rev.com, which is a paid online transcription service. See Appendix 6 for a more detailed explanation of the methods used in the present study.

Data Transcription and Cleaning

The data were cleaned and coded prior to analysis. First, three undergraduate research assistants (RAs) cleaned the interview transcripts and removed any identifying information. We then used a computer-assisted qualitative data analysis software (CAQDAS) called NVivo as a primary tool for creating the codebook, which was used to consolidate the interview data for analysis (NVivo, Inc., N. D.). I analyzed the transcribed interviews to begin creating a codebook, using best practices outlined by Saldaña (2013). The RAs and I then analyzed the data and looked for themes to which we assigned corresponding codes. However, I, as the primary investigator, took on the responsibility of creating, revising, and maintaining the master list of codes, as recommended by MacQueen, McClellan-Lemal, Bartholow, and Milstein (2008). The analysis team met several times to discuss our varying coding strategies until an acceptable level of agreement was reached to develop the initial codebook (Saldaña, 2016).

Once the preliminary codebook was created, I selected a single transcript which we all coded separately. This was done to determine interrater reliability, which I calculated using Cohen's Kappa. After using the initial codebook, I found our levels of interrater reliability to be insufficient and below .61, the standard threshold suggested by Landis & Koch (1977). After meeting with the RAs to identify the problems with the codebook and make revisions, I created a second and final version of the codebook. All of the RAs and I coded a different transcript using the revised codebook. After this was completed, I re-calculated the interrater reliability and found an overall Kappa value of .85 between myself and all three RAs. This is considered a near-

perfect level of agreement (Landis and Koch, 1977), which allowed us to continue with the coding process. After a sufficient level of interrater reliability was established, each undergraduate RA coded one third of the transcripts, and I coded all of them as well. I then recalculated the interrater reliability coefficients between myself and each RA. I used that information to calculate the average Kappa between myself and all of the RAs combined, which is considered to be a proper method of estimating interrater reliability (Warrens, 2014). I found that our overall Kappa value for the entire dataset was .79, which is considered to be a substantial and acceptable level of interrater agreement (Landis and Koch, 1977). I then subjected the data to a thematic analysis to address the primary research questions. The goals of the analysis were to formulate detailed descriptions of the health and safety issues found in tasker work and to identify patterns in tactics used by taskers to address those issues. Appendix 6 provides additional background and information on how the data was analyzed, and Appendix 7 contains a copy of the full codebook.

Results

The following are my main findings from the interview data. First, I will describe the primary health, safety, and stress-related experiences identified by the participants. Then, I will discuss the contextual factors that emerged from the data that appear related to participants' health, safety, and stress. These contextual factors include the boundaries that taskers choose to create for themselves, how and why they choose to enforce those boundaries, and the personal identities that may be connected to individual differences in work experiences. Finally, I will acknowledge that the data collection for the present study occurred during emergence of the COVID-19 outbreak, and I will discuss taskers' experiences with the pandemic in relation to their work.

Health

A commonly held belief expressed by participants was that their physical health was largely unaffected by their TaskRabbit work, but upon further exploration, the relationship appeared to be more complex. Participants who primarily performed physical labor often reported that the work itself is exercise, and therefore they do not need to exercise during their nonwork time. However, taskers who did not perform physical work occasionally reported that they had troubles with devoting time to exercise. Additionally, a current challenge reported by participants was that they had difficulties with eating healthy while on the job. Because taskers often have jobs in multiple locations during the day, they may have a hard time purchasing and eating healthy food. Although some taskers reported bringing their own food, others stated that they did not have time to meal prep or eat while they are working.

Another way in which TaskRabbit work was related to participants' health was through their perspectives and behaviors related to taking breaks on the clock. Participants who typically

worked for short periods of time often indicated that they did not need to take breaks. Rather, a typical strategy for taking breaks was to space out the scheduling of tasks so that the tasker could rest in between them. For longer tasks, participants often reported not taking breaks. Reasons for doing this included wanting to get the job done faster to get home sooner, as well as the acknowledgement that taskers are not legally entitled to breaks. Another interesting explanation brought up by participants is the gray area of taking a break while the client is paying for that time. One participant explained that clients “don't want to be paying for [your time] and see you lounging around and all.” Below is another anecdote from a 42-year-old female tasker illustrating the potential risks for taskers associated with taking breaks. She is describing a time when she was hired alongside another tasker to perform the same task together. This sheds light on some potential for competition between taskers, which may result in pressure to do things like skip breaks in order to appear more hardworking compared to competing taskers.

A theme I've noticed is if it is me and another tasker and I don't take a break and the other person takes a break and the client says, "Okay, I've got now enough done where I think I can let one of you go", the person who is taking a break is the one who gets let go.

Finally, an important consideration is that the lack of health insurance provided by TaskRabbit plays a contextual role in the health of taskers, particularly those who do not have access to health insurance through other means. Participants sometimes had access to health insurance through sources outside of TaskRabbit such as an employer or spouse. However, those who did not have these options sometimes expressed concerns about the lack of benefits. One participant described a notable encounter she had with a different tasker that highlighted the potential precarity of their work.

I've had other taskers tell me, "Oh, I got hit by this box", or "something fell and hit me in the head." She just went to the hospital really quickly and then patched herself up and then went back to another gig which I thought was kind of crazy. It was just like wow, but she couldn't do anything about it and she didn't really have any type of insurance that would take care of it.

In summary, taskers reported a number of ways in which their health was connected to their work. While on the job, participants reported varying experiences with protecting their health through activities such as exercise, eating healthy, and taking breaks. Outside of work, participants also indicated that their work influenced their health through the lack of health insurance and other benefits. It appears as though the TaskRabbit platform has some areas of improvement for protecting and promoting the health of its workers. See Appendix 5 for some additional health-related findings.

Safety

Safety Risks. Participants frequently stated that they have not had any safety concerns, but others told stories about circumstances that they deemed unsafe. The most commonly reported concern in TaskRabbit work was tasks involving physical labor, for which ergonomic risks may be present. Below is a selection of such stories, but the list is not exhaustive. Among all of the participants who reported these dangerous situations, a common theme was that they either underestimated the task or were not informed of what exactly the task would be, prior to their arriving at the location. This is exemplified by the following quotation provided by a 30-year-old male tasker who often performs manual labor services.

I was hired to [perform an unsafe constructing job] without any safety gear basically, me and another guy. And so we get there and immediately we're like, "I don't know if we should do this."

Even if the tasker has developed a good understanding of the task prior to arriving, there can still be some risks involved. In the following story, a male participant in his thirties describes a time he was asked to lift an object with the help of another tasker. As is described, the object was well above the 50-pound, per-person limit specified by OSHA.

There was a massage chair. It was one of the first ones I ever did. And it was one of those that weigh like 300 pounds ... I didn't get hurt too much, I just got hurt, because it weighed a lot. First, it was awkward, and the stairs were winding. It had a little curve to go [to] the other side. And then, I didn't feel it till the end of the day. It was an injury on my neck, but it wasn't that bad, you know. But, that's the only time I got hurt. And then the other tasker actually fainted. He fainted on the job.

Performing these tasks through TaskRabbit may be more unsafe compared to other avenues such as moving companies, due to the unregulated nature of whether or not the tasker is working alone. Participants who performed moving tasks often recalled a variety of situations, indicating that clients typically help them with moving. However, clients helping out with moving tasks may not be ideal, as evidenced by a participant stating that "I don't really like [it] when a client helps, 'cause they don't know what they're doing, like... [I'd] rather just cancel it..." Clients may also hire more than one tasker for the job. Additionally, taskers may be asked to perform moving tasks alone, as evidenced by the following quote from a 24-year-old male tasker:

I tend to do [it] alone because I have no one else with me. It's not really dangerous but like... lifting heavy stuff that is meant for two people even when it says on the description of a couch, "Hey, you should do that with a buddy." And I gotta do it alone, [so] it can be kind of risky but...I'll essentially muster...

Beyond ergonomic risks, participants also described their safety experiences with chemical, physical, and biological agents. None of the participants reported dealing with dangerous chemicals or extreme hot or cold. Accounts of working in uncomfortably hot conditions (e.g., working outside in the summer or working in hot rooms) were present, but infrequent. In terms of biological agents, a common concern brought up by participants was getting sick through interactions with clients in their homes. No participants said they contracted a sickness by entering a client's home, except for one report of a case of bedbugs resulting from a cleaning task. Another potential concern is taskers may enter homes without being made aware that animals are present, which may pose a danger for people with pet allergies or if the animal does not behave safely towards taskers. A participant who primarily performed packing and cleaning jobs recounted a time that a dog was present while she was working:

It was someone's place to clean and they ended up having a Pit bull there, and I was ignoring it 'cause I'm like okay, I don't want to be a total scaredy cat (laughs). So I was like, okay, I'm not going to be scared of this thing. So, I go up there and then the dog just starts biting, like trying to nib at me, and then the owner eventually came out there and put it in another room, but then she had to let the dog out or it was going to knock down her door. So, that was one instant where I was kind of scared... like, okay, let me finish this task and get out of here and never go there again (laughs).

TaskRabbit's Role. In order to investigate what taskers think TaskRabbit's role is in their safety, I asked participants who they thought would be held responsible if they experienced an injury on the job and received extremely mixed and varied responses. The most prominent trend was that participants were largely unsure of what exactly would happen if they were injured, or who would be responsible. As was stated by a 26-year-old female participant, "It's so unclear. And I'm sure they have some kind of insurance in place. But I'm really not clear on what is involved at all, and it's very confusing." Among these participants, some mentioned that they may have had the situation communicated to them at some point, but they did not recall the information. Less commonly, some participants believed that the responsible party would change based on individual situations, and others believed that either TaskRabbit or the client would be responsible.

Nevertheless, it was also very common for participants to articulate that they were, in fact, fully responsible for themselves if they became injured. Of those who did express this, however, not all participants were completely certain. Below, a 55-year-old male participant explains his perspective on the matter.

Oh yeah, no we'd be in trouble. Because that's the thing; you've gotta know that and you've gotta account for it, because no, they don't offer us any kind of insurance. You can be certain that they would strictly disclaim any kind of liability as an employer. So workman's comp... you wouldn't earn any money. So, I mean you know that. You're on your own. But that's also why I will push them with policy stuff. I know full well that they're not going to look out for me if something goes wrong for me. So I'm not going to pretend, for their benefit, that I'm their employee.

Interestingly, when asked who *should* be responsible in the event of an injury, the most popular response was that TaskRabbit should in fact take accountability. Although some participants acknowledged that there could be some difficulties in providing insurance to taskers, they consistently indicated that it would be their preference in an ideal situation. The following quote from a 26-year-old female participant captures the complicated feelings that she had about the topic:

I definitely have really mixed feelings about it. Personally, obviously I'd prefer if they took liability. But I think even if that is the case, it's so hard to determine when that start[s], you know? Does it start once I leave my house? Does it start once I'm at the location? Does it start when I'm on the way there? ... And then what sorts of things they'd be liable for too, you know? If I go into a task and I'm drunk, and I get in a car accident on the way there... obviously that would be my fault, but I mean, I don't know.

However, not every participant thought that TaskRabbit should accept responsibility for their safety. A less common response was that the client hiring the tasker should be responsible, and not TaskRabbit. Another less frequent perspective was from participants who believed that TaskRabbit should *not* be responsible for their healthcare. This perspective is illustrated by the below quote from a 56-year-old male tasker who conducted home-repair services both through and outside of TaskRabbit. Those who did not want TaskRabbit to be liable stated that this was because they were choosing to be independent contractors, and therefore were willing to accept responsibility for their own safety.

...I don't have any expectations from them because I don't work for them. I have my own business ... you know, they're just a lead generator. They're generating leads for me. And that's it. I don't really want them to do anything else.

In summary, a number of safety risks appear to be present on the TaskRabbit platform, with relatively minimal efforts set in place to protect workers from these risks or promote their safety. Safety risks were predominantly related to ergonomic risks, although other types of risks were also present. In the absence of any guidance or resources related to safety, taskers have developed their own safety strategies as a result and draw upon their own resources to provide needed materials such as PPE. Furthermore, taskers commonly expressed a lack of knowledge about their own safety protections at work, such as whether TaskRabbit claims any liability in the event of an injury. Additional safety-related results can be found in Appendix 5.

Stress

Interpersonal Stressors. A common theme expressed by participants was that their client interactions were seen as very good overall, despite some occasional issues which are described below. Participants also sometimes expressed that they actually enjoy the client-facing side of their work. Another common response was that clients were sometimes very hospitable, to the point of offering refreshments like snacks and water.

However, participants did often cite interpersonal interactions as a major stressor in their work. By far, the most prominent stressor noted by participants was client interactions. Stress from these encounters often derived from customers being rude or making requests for the tasker to do unreasonable or uncomfortable tasks. Other participants became stressed when clients micromanaged them and/or watched everything they did very closely. The below quote from a 30-year-old male tasker is one of numerous examples that participants provided:

I went to this guy's apartment. He was a weirdo and it was a small place. And it was just so weird. He wanted me to do his laundry, which I wasn't into, and I didn't know he wanted me to do his laundry, but I was like, "You know what? He's an older guy. I'll help

him out, you know." And then he wanted me to fix his bed, but he just kept watching me and it was weird and I was like, "Ugh." I was just miserable, and so I wanted to get out.

More concerning, though, is the fact that participants did occasionally report client interactions which could be considered sexual harassment. The participants who did report first-hand experiences with such behavior were all female. These behaviors included mild flirting and more escalated situations. As an example for an extreme situation, one female participant said that "I was supposed to be someone's personal assistant and try to help them with errands and computer work and all that stuff. And then they end up asking for massages and stuff. I'm like, no (laughs)." An additional, but less direct example is from a male tasker who recalled some experiences that he heard about from other taskers.

... They show up at a place to do some cleaning or do some organizing or some personal assistance work and, really, the guys are just looking for a date or some type of inappropriate behavior. So I would warn the young girls about that because I've had some taskers tell me about those experiences.

Female taskers described various strategies that they used to deal with concerns related to sexual harassment. One tasker reported that she brought her own food with her to tasks to avoid it being tampered with. Another tasker expressed that she sometimes would wear baggy clothes to appear less physically attractive, and discouraged flirting behaviors by clearly expressing that she was married. Lastly, two taskers reported carrying products for self-defense such as a gun or pepper spray. A female participant who worked on cleaning tasks expressed her reasoning behind her decision to carry a gun with her:

I hate saying that, and it's a bad world we live in that you have to do that, but at least you have it in the back of your head that you have some way to protect yourself if something were to happen.

These behaviors indicate that female taskers often perceive their interpersonal safety to be at risk while they are working, particularly when they were entering new or unfamiliar locations. Not only is interpersonal safety a concern when it comes to these reports, but it should also be considered that taskers often found the mere threat of these potential occurrences to be highly stressful.

Algorithmic Management. Another stressor besides interpersonal interactions was the algorithmic management on the TaskRabbit platform, with the most prominent concern being the app's Support Center, which provides taskers with important information and assistance with work-related problems. The support system was frequently described as inadequate, not timely, and stressful to use, although there were participants who also praised the support system and said that they had no issues with it. The following selection, provided by a 42-year-old female tasker exemplifies a common perception of the support system.

Customer service is really bad too (laughs).It's really hard to get a hold of them. You have to email them. There is a phone number that you have to really look for, but they never pick it up and they don't really call back.

When it comes to disputes with clients, the support system may be easier to navigate for people who have been able to document whatever has happened on-site. Participants who reported doing this were able to advocate for themselves via the support system. In the following quote, the participant describes a dispute he had with a client, in which the client tried not to pay him for a task. While still on the job, the participant decided to take pictures to provide

documentation of his work in case it was later needed. That being said, it is not clear whether TaskRabbit ever suggests using this strategy to taskers, so some may not have thought of this option.

[Interviewer: And if you hadn't taken the initiative to take those photos, what do you think would've happened? Do you think it would've been different?] Yeah, I mean, if I couldn't prove what I was saying, they may have believed the customer. Right? The customer's always right. So they may have believed the customer. They [could] have refused to take the bad review down, which lowered my rating.

Relatedly, the 5-star rating system on the app also came up as a source of stress. It should be noted that not every participant found their ratings to be stressful, with some stating that they do not pay attention to their ratings at all. Although participants often stated that they do think it is a fair system, or that it is necessary in some form, there were still many accounts of stories in which a tasker received an unfair rating based on circumstances outside of their control. Examples of these circumstances included the client being in a bad mood, the client underestimating the amount of time needed to complete a task, and disagreements over how the task can be completed. When this happened, taskers often reported frustrations with not being able to respond to the review, or not being successful in having it taken down. This may be concerning to them because participants often believed that their 5-star ratings are directly related to their pay and work hours. Below, a participant who primarily conducts home repairs describes a frustrating experience he had related to his ratings.

I had a lady leave a bad review saying that I did a bunch of stuff that I didn't do because I was telling her that you couldn't do this a certain way because it's against the [building]

code. And “If I leave it like this you're probably gonna have an electrical fire.” But she couldn't get her way. She took it all personal and wrote a bad review.

In contrast, the main avenue for participants in giving feedback about their clients appears to be the client rating system. When taskers complete a task, they are asked to review the client with a “thumbs up” / “thumbs down” function. If the tasker chooses the “thumbs down” option, the TaskRabbit system will not allow the client to hire that specific tasker again. However, the client is not removed from the platform. Some participants expressed some disappointment that they do not get to see the clients’ ratings on the app before they accept a task, even though TaskRabbit does compile that information. Conversely, a rare occurrence was that participants would say that they are able to see client ratings. It is possible that the information is technically available on the platform but is not easy to access. For example, a participant reported that she was able to gain access to that client’s ratings through a formal channel when she asked for it directly.

A third system that is relevant to taskers’ stress experiences is the acceptance ratings, which reflect the extent to which a tasker chooses to accept tasks that are given to them. In other words, the ratings go down whenever the tasker declines a task. Interestingly, a common occurrence was that participants would say that they are not aware of the acceptance ratings function. This may be because the acceptance ratings are not readily presented on the app in the same way that the 5-star ratings are, as evidenced by the following quote: “...I don't remember it being something that I see when you're logging in. I know it's somewhere within the app, but you have to do a little bit of digging around on the site to find it.”

For those who did pay attention to the acceptance ratings, the feature was often described as a source of stress. As seen with the 5-star ratings, participants sometimes reported cases in

which their acceptance ratings went down due to circumstances outside of their control. These circumstances included falling asleep before accepting a task prior to the 9pm deadline, and not performing many tasks due to the COVID-19 outbreak. Below, a 34-year-old participant who primarily performed cleaning and administrative duties describes a time when she declined a task due to safety concerns, which lowered her acceptance rating:

I responded back to him, but then the thing was, I got dinged by the TaskRabbit platform for rejecting that job. And I wish I wasn't dinged for something that I didn't feel [was] safe. I feel like if you don't feel safe taking a particular task, [then] I feel like your performance on TaskRabbit shouldn't be affected.

In conclusion, taskers face a number of stressors while they are at work. These stressors largely fall under the two main categories of interpersonal stressors (i.e., client interactions) and algorithmic management (i.e., interactions with the TaskRabbit platform). However, other stressors outside of these two categories exist as well, such as managing the amount of time spent on tasks, using public transportation, dealing with traffic, managing personal finances, and completing work in a satisfactory way. Many of these stressors appear to stem from a lack of power that taskers have to protect themselves from certain adverse situations such as rude clients or unexpected changes in how the platform works. Other stressors may stem from ambiguity found in tasker work, such as a lack of communication with any supervisors and the unpredictable nature of tasks themselves. Appendix 5 includes additional information on the aforementioned miscellaneous stressors.

Quality of Life

Fortunately, one of the most dominant themes seen across participants was the assertion that TaskRabbit's flexibility in scheduling offered an improvement to their quality of life. In

other words, taskers widely said that they enjoy that they have the freedom to only work during times that they choose. Relatedly, participants often alluded to not having a “boss”, which meant they did not have to worry about asking for time off. Below is a description of this benefit by a 33-year-old female tasker:

...I kind of like it because my schedule is forever changing, and I'm glad that there isn't a certain quota that I'm (laughs) expected to meet. But I can be flexible with that and make my own hours, so that's nice. I'd say that's probably the best thing of all.

Although the flexibility of work hours was overwhelmingly described as positive in this sense, there were some potential downsides as well. For example, it could be an issue when the work would suddenly dip without warning. This was a very widespread occurrence during the COVID-19 outbreak, but some participants recalled that this happened during other periods of time before the pandemic as well. Another rare, but present occurrence was taskers stating they would sometimes prioritize their work over things they would otherwise do in their spare time, such as hanging out with friends. However, these participants provided the caveat that it was their choice to do so, not TaskRabbit's requirement.

Improvements to quality of life were not just limited to flexible work arrangements. Participants also pointed to the social benefits of meeting with new people. Some taskers found that the tasks themselves were fun, sometimes stating that the variety of work was particularly enjoyable. Others still said that they had experiences with tasks that they thought were good and contributed to society, which was fulfilling. Finally, two taskers explained that the better pay offered on the TaskRabbit platform improved their quality of life compared to other gig platforms or jobs, to the point of allowing them to move on to new professions. One participant

was able to move on and pursue a college degree, and the other was able to start a business, as she describes below:

It was a whole game changer for my life. I got my weekends back. But gig work in general is just awful. And also really great. It's like anything else that is worth pursuing, it's awesome and awful. And the reason I continue doing it is so I can give birth to this wonderful company that has come together over the past couple of years, so it's worth it.

Contextual Factors: Task Boundaries and Identities

Task Boundaries. A prominent theme that emerged from the data was that taskers' work-related boundaries seemed to be connected to their health, safety, and stress experiences. I will refer to this phenomenon as task boundaries, or the expectations that taskers set for themselves for what they are and are not willing to do while completing tasks. The following section outlines my findings on what participants' boundaries are, how they choose to enforce them, *why* they choose to enforce them, and why they may allow breaches to their boundaries.

The task boundaries described by the participants were largely clustered around a number of decision points. One of the most dominant of these decision points was the willingness of a tasker to perform work outside of the original task description, as was established in online communications prior to starting the task. Numerous participants explained that clients sometimes ask for additional work to be done, even if it is outside the realm of the category they were initially hired for. For example, a tasker may arrive at a location to perform a cleaning task, only to have the client ask them to also walk their dog. Another decision point that taskers referred to was the extent to which they were willing to do tasks they considered to be unsafe. Additionally, when a client asks a tasker to do something that is against TaskRabbit's rules (for example, accepting payment outside of the TaskRabbit app), the tasker must also make a

decision and act accordingly. Other decision points include dealing with difficult clients, taking breaks, accepting tasks that are less financially lucrative than others, and performing gross, degrading, or inappropriate tasks. A few examples of these undesirable tasks that were mentioned include cleaning up messes purposefully created by the client, working in uncomfortably hot conditions, and unpleasant cleaning tasks. Finally, taskers may choose to set boundaries for what they are willing to do based on personal preference (for example, only doing interior design tasks and not organizing closets). The need to establish these boundaries may stem from a level of ambiguity that is unique to TaskRabbit. Compared to other gig economy platforms, TaskRabbit allows for an extremely wide variety of services, as indicated by one participant who often accepted tasks resembling “errands” such as cleaning and personal assistant work:

I've worked with other companies similar to TaskRabbit, and TaskRabbit is kind of the only one where services and such get really gray. You know. I've worked for other companies where cleaning is cleaning. This is this. That is that. Whereas TaskRabbit is like, "Oh, can you do this and can you do that? And, can you lint roll my couch?" And just like all these like really silly oddball things. And a lot of times people will kind of push the envelope...

Participants brought up a number of strategies that they use to enforce the above boundaries. The most common was to establish very clear communication with the client. This could be done by clearly defining the task boundaries using the chat function with the client before arriving to the location, but could also be established in-person once the tasker arrives and evaluates the situation. Some taskers also noted times where they chose to leave the task altogether rather than allowing one of their task boundaries to be breached. There was also a

participant who noted a method in which she would charge more money if the client asked her to do work outside of the task description, depending on the level of risk she deemed to be associated with the labor. Below, a 29-year-old participant who conducted cleaning duties outlines how she establishes her task boundaries:

...Sometimes in conversations, people will ask you, “Hey, I know this isn't on your list,” or, “I don't know if they let you do these kind of things, but will you do this?” And most of the time in conversations when you're first starting to talk to people, you have to stand your ground and say, “Hey, I stick to this list and that's it.” You know, most people are really accepting to that.

A variety of reasons were identified for why someone chose to enforce their task boundaries if they were being encroached upon. A primary reason for doing this is if the tasker chooses to prioritize their own health or safety over the job at hand. Another reason taskers described enforcing their boundaries was because they wanted to avoid the stress or discomfort associated with that task. In addition, taskers may choose to enforce a task boundary if they feel that they are not qualified to perform that work.

Conversely, there are also reasons why taskers did allow breaches to their task boundaries, which all were largely centered around finances. Participants did occasionally say they completed tasks that they did not want to do because they simply needed the money. Even if participants did *not* report ever being in that situation themselves, some did suggest that they had more agency to say “no” if they wanted to, due to the fact that they were not financially dependent on the income. Another, relatively uncommon response was that participants were worried that their ratings would go down if they declined too many tasks. This may be a genuine

concern, as evidenced by the following story. The tasker explained that this occurrence happened after she had taken a month-long vacation, during which she did not work through TaskRabbit:

I came back, and then I noticed [that] it's hard for me to get everything back up. So I waited a couple weeks, and then finally I got another gig, and then I got another one. And it's just like, I just have to keep accepting. Because if I declined one, it would take me forever to get (laughs) some more gigs. So I just kept doing it, and then finally I got back up to speed on getting myself seen on the platform. [Interviewer: During that time, did you accept tasks that you wouldn't normally?] Yeah, I did. I did accept some that I probably wouldn't have ever done. It was a lot of one-hour tasks. And my hourly price was kind of low, but I was like, okay, I need some type of money, and I need more gigs. So if I don't accept it, I'm gonna end up being pushed back further.

This issue of financial precarity may be worsened even further if taskers feel pressured to ask for low rates for their services. Communications from TaskRabbit that may contribute to such feelings, as is reported by a participant:

There's a lot of downward pressure communication from them. Like, "You'll get more clients if you charge less," or, "The market rate is around \$19 an hour for a furniture assembly." And I just find that... I live in San Francisco. You can't literally pay the rent on \$19 an hour. It's just, it's absurd.

Personal Identities. A number of individual differences held by taskers also appeared to play an important role in their health, safety, and stress experiences with their work, such as identities that tie into external life situations. For instance, the access to a spouse's income and/or health benefits may mitigate any concerns taskers may otherwise have about the lack of benefits provided by TaskRabbit. As previously mentioned, the perceptions of how much of a role

TaskRabbit should play in providing health and safety protections may also be affected by a tasker having a strong identity as an independent contractor, rather than an identity that more closely resembles that of an employee. On another note, participants with caregiving responsibilities often noted that their childcare responsibilities played a role in their decision to work through TaskRabbit, due to the flexibility of scheduling.

Relevant personal identities may also be tied into a person's physical characteristics. The most common of these identities mentioned by participants was gender. Female participants often brought up that their gender identity was directly related to their concerns about interpersonal safety. Relatedly, participants also discussed how their age is related to their work. Some taskers expressed that they are older and therefore are not able to perform physical labor at the same level as they did when they are younger. In addition, young taskers would sometimes say that their young age is a reason why they are able to do the kinds of work they do on TaskRabbit. In the following quote, a 30-year-old participant contrasts his experiences with older taskers performing the same job. In this example, he was performing physical labor for which multiple taskers were hired.

I was able to do it, but you'd take tumbles, and you'd get beat up, and it was (laughs) more funny than anything. But if I was old... There were some guys who were a good bit older than I am, so if they got injured... There were guys who were just chilling there and you could tell they were resting 'cause they were probably beat up, but they're not going to say anything.

Perhaps surprisingly, none of the participants indicated that they thought their race or ethnicity was connected to their TaskRabbit work, though it should be noted that I did not ask about racial/ethnic identity directly. This may, in part, be due to the structure of the TaskRabbit

platform. As described by a non-white participant below, clients are able to view the profile pictures of taskers before they choose to hire them:

You have your profile picture. And you have your name, your phone number, your email. So, if somebody doesn't like you, like before you picked up a task and someone's like, "No," they would just cancel the task. It wasn't a big deal. You had no idea why they were canceling the task. They could've just decided they wanted somebody at 4:00 PM instead of at noon.

Results Related to COVID-19

The data collection period for this study coincided with the early stages of the COVID-19 outbreak (i.e., from late March through the end of May), which is an important context to consider in the interpretation of my results. To summarize my findings related to taskers' experiences with the pandemic, many taskers reported that their work had gone down or stopped altogether during this time. Others often reported that they stopped working through the app out of their own volition. Another way in which TaskRabbit work changed for participants was that they altered their behaviors while on the job. These differences in behavior included wearing masks, social distancing, avoiding using clients' bathrooms, and choosing different kinds of work. In fact, those who did continue working sometimes noticed that the types of tasks being offered were different than before, such as a larger volume of virtual and delivery tasks. However, these types of tasks may not pay as well as others, as described by a participant who largely performed physical labor services such as furniture assembly:

There's still delivery things on there and I'll do those every once in a while, but a lot of times, mentally there's less incentive to do that, because I could be making so much more doing furniture assembly, like this is kinda depressing to go do this other thing.

I also inquired about what the TaskRabbit company has done in response to COVID. Participants recounted that TaskRabbit sent out emails and announcements about staying safe during the pandemic, which some pointed out were not substantially different from emails sent out by other companies and institutions. Some participants said that TaskRabbit was providing an opportunity to buy masks and other PPE, in an effort to combat any difficulties workers may have in acquiring those materials. Another rare report was that TaskRabbit added a new category of tasks called “contactless work”. That said, none of the participants said they were faced with any hard-set rules or restrictions in relation to their TaskRabbit work, such as setting maximum task quotas or being mandated to wear masks. These findings highlight TaskRabbit’s relatively relaxed approach to handling the COVID-19 pandemic, according to participants. In conclusion, the pandemic highlighted the precarity of TaskRabbit work, given that taskers do not have a formal agreement with TaskRabbit that resembles what is found in traditional employment.

Conceptual Model

A conceptual model that illustrates the main findings from my thematic analysis can be found in Appendix 9. In this model, the task is represented as a source risks found in TaskRabbit work, including health hazards, safety hazards, and client interactions which may result in stress. The algorithmic management on the app is also represented as a source of stress, namely through the support system and rating systems. These environmental factors appear to be connected so health, safety, and stress outcomes for workers. The model also presents task boundaries and personal identities as contextual factors that may influence the extent to which these environmental factors contribute to adverse outcomes for workers.

Discussion

The purpose of the present study was to investigate the health, safety, and stress experiences of taskers from a TWHTM perspective. This was accomplished by identifying the primary risks and concerns that taskers had with respect to each of these categories. When asked about health experiences, participants most commonly reported that their work was connected to their exercise habits and diet, and sometimes reported difficulties in taking breaks. The fact that TaskRabbit does not provide health insurance was also a more salient concern for taskers who did not have insurance through another source, such as a spouse or employer. The most prominent safety concern reported by taskers was ergonomic risks related to physical tasks such as lifting, which is concerning given that taskers often either work alone or with strangers. Taskers also cited interpersonal safety risks as a major concern, especially when taskers were female. In terms of stress, taskers largely discussed their client interactions, but also reported becoming stressed due to ambiguities related to the algorithmic management on the app, including the support system and the rating systems. It should also be noted that TaskRabbit work does offer improvements to taskers' quality of life as well. Furthermore, the important contextual factors of task boundaries and personal identities were also described. This information has theoretical as well as practical implications for OSH research and practice.

Theoretical implications

These findings support the utility of the TWHTM approach for investigating the health, safety, and well-being of gig economy workers performing in-person labor services. This is because the flexibility of the TWHTM approach allows for the capturing of useful information about not only the health and safety risks found in TaskRabbit work, but also the benefits such as improved quality of life (Tamers et al., 2019). This information is critical because any subsequent

interventions or recommendations should recognize and preserve these positive aspects of TaskRabbit work. For example, flexible scheduling appears to be a major benefit of the platform and is likely a major reason why people are drawn to this kind of work. This is in line with previous research that suggests that other gig companies serve this benefit as well (Hooker & Kim, 2019; Lehdonvirta, 2018).

The TWH™ approach allowed for an in-depth exploration of health, safety, and stress from a protection and promotion perspective. When discussing their health, participants often noted that their work did not pose health risks to them directly. Rather, they reported difficulties in pursuing health activities in their nonwork time such as eating well and exercising. This relates to the TWH concept that workers' lives outside of work should be considered when evaluating their health and safety conditions (Tamers et al., 2019). In addition, taskers rarely reported that their work interfered with their social lives, which contrasts with previous research with on-demand drivers (Malin & Chandler, 2017). Regarding safety, TaskRabbit does not appear to provide adequate safety protection to workers through disseminating safety information and providing PPE, and also does not promote tasker safety through initiatives such as promoting PPE usage. TaskRabbit may also fail to promote worker well-being, as evidenced by the stressors faced by taskers. It should be noted that the two most commonly reported stressors – client interactions and algorithmic management – have also been seen in other gig economy platforms (see Hooker & Kim, 2019; Malin & Chandler, 2017). Although improved quality of life was a highly dominant theme in the interview data, the fact that taskers described numerous health and safety risks of varying levels of severity is of interest; according to the TWH™ approach, the most effective means of preventing health and safety risks is to begin with eliminating or reducing workplace hazards before implementing any other interventions

(NIOSH, 2016). As such, the health and safety risks identified by participants may be particularly salient for the well-being of taskers and should be the subject of future interventions.

In summary, the findings of the present study shed light on the most important aspects of TaskRabbit work to address in interventions moving forward. Based on participant responses, the most salient concerns which require increased health and safety protection efforts are difficulties in taking breaks, ergonomic risks, and interpersonal safety risks. In terms of promotion, the most prominent issues were limited ability to pursue exercise outside of work and eat healthy, a lack of efforts to encourage PPE usage, and stress associated with client interactions and the algorithmic management used by TaskRabbit. Finally, researchers conducting interventions with taskers should also be mindful of the ways in which TaskRabbit work offers improvements to quality of life, through benefits such as flexible scheduling.

A second contribution of the study is the discovery that task boundaries and identities may be an important theoretical area of study for on-demand, in-person laborers such as taskers. The task boundaries that taskers choose to set for themselves, as well as the individual characteristics and identities that they possess, appear to be salient contextual factors in how they experience health and safety. In particular, financial need may play a pivotal role when taskers choose to accept work that they are not entirely comfortable doing. This may be especially true for in-person labor services, given that taskers often invest time and resources (i.e., transportation costs) to arrive at the location of the task before they are able to fully assess the situation. This situation reflects an unequal power dynamic in that clients have more freedom to make unreasonable requests as taskers have to reject them. For example, a tasker with high financial precarity may not be able to afford missing out on a paycheck and thus could end up being pressured to do work that is unsafe or otherwise undesirable. According to Social

Interdependence Theory, a state in which an individual has little control over their own goal achievement (i.e., performing safe work and getting paid) and is instead dependent on the actions of others can lead to decreased psychological health (Johnson & Johnson, 2005). This may have been of increased importance during the COVID-19 pandemic, when health and safety risks are subsequently much higher than in previous times.

Gender appears to be an important personal identity to consider when it comes to understanding the experiences of taskers. Not only did female taskers report feelings of distress related to interpersonal safety much more consistently as men, but they also reported more cases of instances in which they were subjected to sexual harassment. In order to combat these potential risks, female taskers reported a wider variety of safety precautions compared to men, ranging from dressing conservatively to carrying personal defense equipment. For gig workers performing in-person services in clients' homes, it may be important to consider that women may be a particularly high-risk group for interpersonal safety concerns, as well as stress associated with their client interactions.

Conversely, other identities may play a different role as was initially anticipated, such as race and ethnicity. Based on the interview data, race and ethnicity generally did not come up as a source of interpersonal stressors, despite the fact that other research on gig work has suggested that these are important factors (Crain, Brossoit, Robles-Saenz, & Tran, 2020). However, TaskRabbit's user interface may be different from what is seen in previously studied companies because clients can see taskers' profile pictures on the app and choose who to hire based on that information. Rather than manifesting as interpersonal stressors, discrimination on the TaskRabbit platform may largely be limited to pay discrepancies, a topic explored in more detail in a previously conducted study by Hannák et al. (2017). In conclusion, the consideration of task

boundaries and tasker identities provides context and clarification for how individuals can have vastly different experiences on the same platform.

A final theoretical implication is that the ambiguity found in TaskRabbit work may result in differences in work experiences compared to other platforms. It was discovered that the TaskRabbit platform may be unique from other companies in that its workers perform a wide variety of jobs with relatively little restrictions for what those jobs may be. In contrast to workers on platforms like Bellhops and TaskEasy who perform only one type of task, taskers may have a comparatively harder time enforcing their task boundaries. This is because of the ambiguity in what a “task” is officially defined as on the platform, allowing clients more freedom in asking for unusual work to be done, which taskers may or may not be comfortable doing. This finding helps to inform any recommendations provided to gig workers more broadly, as those suggestions may not have otherwise been applicable to taskers who face these unique ambiguities in their work.

Practical Implications

Implications for Taskers. The present study has practical implications that may be of interest to taskers. Taskers may consider engaging in careful self-evaluations of their own task boundaries when working through TaskRabbit, in order to provide a strong foundation in the event that a boundary is reached. Examples of boundaries include not performing work outside of the original task description, refusing to lift large furniture or other objects without a partner, and refusing to break TaskRabbit’s company policies. These clearly established boundaries can then be enforced through a number of methods, which may aid in avoiding stressful negotiations, as well as situations which pose a threat to the worker’s health, safety, or well-being. For example, taskers can focus on establishing clear, written expectations for what will and will not

be done as part of a task prior to their arriving at the designated location. Taskers can also document relevant information on-site, such as taking pictures of their completed work, in case they need to defend their performance later. In order to avoid interpersonal safety risks such as violence and sexual harassment, taskers may consider declining tasks if they are not able to get enough information about the task beforehand, or otherwise feel that the task may be unsafe. However, it should be noted that task boundary preferences may vary from tasker to tasker.

Outside of setting strong boundaries, taskers can use other methods to protect themselves from health, safety, and stress-related risks in their work. For example, taskers can educate themselves on proper lifting procedures and PPE usage to prevent musculoskeletal injuries. In addition, taskers can protect themselves from interpersonal safety risks by telling a trusted person about the times and locations of their tasks and then checking in with that person when the task is complete. This would serve as a tracking system in the event that a tasker would experience any harm on the job, which is not a service currently available on TaskRabbit.

Furthermore, in the absence of efforts by the TaskRabbit company to disseminate health and safety information, it is important for taskers to educate themselves on what health and safety-related benefits are currently available to them, through TaskRabbit as well as other relevant institutions such as their current health insurance. Taskers can learn about their rights on the platform via the TaskRabbit Happiness Pledge (TaskRabbit, Inc., 2018a) and Terms of Service (TaskRabbit, Inc., 2019d). For information on their current health insurance, taskers can refer to resources given by their insurance providers. In addition, the U.S. Centers for Medicare & Medicaid Services provides guidance on how Americans can learn more about their health coverage at <https://marketplace.cms.gov/technical-assistance-resources/c2c-roadmap.pdf> (U.S. Centers for Medicare & Medicaid Services, 2018).

Finally, taskers can seek out other taskers through online forums to develop a sense of community and a support system where they can compare experiences and learn from each other. Examples of popular online forums include r/TaskRabbit at <https://www.reddit.com/r/TaskRabbit/> and Taskers United <https://www.facebook.com/groups/taskers/> (Reddit, Inc., 2020; Facebook, Inc., N.D.). The use of these forums is supported by the suggestion provided by TWHTM researchers that community support may be of particular importance to gig workers (Schwatka et al., 2018).

Implications for TaskRabbit and Similar Companies. This study also has noteworthy implications for TaskRabbit and similar companies. Among the most notable is that TaskRabbit should consider waiving any consequences that taskers face when denying tasks if the tasker expresses that they have safety concerns about that task. As it stands, taskers who deny tasks for safety reasons run the risk of having their acceptance ratings lowered, which is often perceived as having an impact on their pay rates. This suggestion for change is supported by OSH research recommending that workers should not face any consequences for raising concerns about safety on the job (Casey et al., 2017). These protections should also extend to concerns about sexual abuse or harassment, given that taskers did cite this as a concern and that TaskRabbit currently disclaims any responsibility for these occurrences (TaskRabbit Inc., 2018a).

Another practical implication is that TaskRabbit should consider re-evaluating their communication strategies regarding important health and safety information. This is of interest because TWHTM researchers suggest that organization leaders should prioritize wide communications of important health and safety information (NIOSH, 2016). Specifically, the rights that taskers have in the event of an injury do not appear to be well-communicated on the platform. TaskRabbit appears capable of communicating strong messages, evidenced by the

clearly set expectation that taskers are not allowed to accept work outside the app. Therefore, it appears possible to better communicate to taskers that they are not insured in any way, which could be helpful because a large portion of the tasker population may not be aware of this. This may involve a more memorable orientation session, a process for which taskers often commented that they could not recall very well. Additionally, TaskRabbit could offer more helpful and easily accessible resources. However, they deliberately or otherwise, do not provide certain information which makes it more difficult for taskers to make informed decisions when accepting tasks. This is evidenced by the failure of TaskRabbit to provide clients' ratings to taskers in a clear and accessible manner. Examples of other missing information include whether an animal is on the premises, as well as whether the client is currently sick upon requesting the task.

An additional improvement that TaskRabbit could make to the platform is providing access to free PPE as well as training and educational materials on its usage. This would be in line with OSH researchers' suggestions to provide PPE to workers (Kermode et al., 2005) and offer training programs on how to effectively use it (NIOSH; 2018). Although TaskRabbit does offer some encouragement to use PPE (see TaskRabbit, 2018), these efforts could be improved upon by providing incentives for PPE usage such as praise and small gifts (Goodrum & Gangwar, 2004).

Finally, TaskRabbit may consider providing training for taskers on how to effectively establish and maintain work-related boundaries in order to avoid unsafe situations, as well as stress associated with client interactions and algorithmic management. For example, the company could provide guidance on how taskers can use the app as a record and establish clear expectations for what the job will be, and what the tasker is and is not willing to do. There may also be benefits in showing taskers how to effectively address client accusations of misconduct

via the support system by documenting their work with pictures and other forms of evidence. Additionally, TaskRabbit could provide a specific section on the app itself that is designed specifically for taskers to articulate their own task boundaries, which can be used to negotiate with clients, thus minimizing the power gap between taskers and clients. However, the aforementioned structural changes to the app's systems to protect and promote workers' health, safety, and well-being should be prioritized first, rather than relying solely on these training efforts to encourage behavioral changes in taskers (Schill, 2017).

Implications for Policy. In order for gig economy companies to provide a safe environment for taskers, it is possible that broader policy change may be needed. As has been described by TWH researchers (see Crain et al., 2020), companies have a responsibility to provide their workers with basic human rights through adequate benefits such as healthcare, workers' compensation, and safety training. However, it should be noted that financially speaking, under their current business model, it would be difficult for TaskRabbit to provide these protections to the workers on their platform. In fact, doing so would likely require a substantial change in their business model, to accommodate for the associated costs. Realistically speaking, it is unlikely that TaskRabbit and similar companies would provide these benefits under current federal policies. In fact, recent legislation in California has failed to incite changes thus far in the benefits that workers receive on major gig economy platforms (Brown, 2020). A possible alternative is a single-payer, national insurance program to replace the current private healthcare market (see Medicare for All Act, 2019) to offset some of the associated costs gig companies face in adequately protecting their workers. A participant offers his perspective on the matter:

We ought to get away from employer-funded liability for medical stuff. And we need a more comprehensive way of doing this because the way everything is structured in our system, if they were required to do it, I do understand that there would almost be no new businesses. But that's just because we've chosen the predatory system that we have. So it's an insoluble problem and you've got to be lucky and smart to come out of this okay. You know, you've got to be lucky and smart.

Limitations

The present study has a number of limitations. The first is that the data collection for this study occurred during the COVID-19 outbreak. Given the outstanding and unusual context for this study, it may have limited applicability in some respects to a more typical state of world affairs. Although participants sometimes had trouble distinguishing between their experiences before and after the outbreak, I made an effort during the interview to distinguish taskers' experiences before COVID and their experiences during the pandemic. Participants also frequently cited stories that happened to them prior to the outbreak, which is what the results reported in this document are largely based on (see Appendix 8 for additional COVID-related results). Nevertheless, the fact that data collection happened during the pandemic may actually be a strength of the study, in that it helped bring to light some aspects of the precarious nature of TaskRabbit work. These aspects include the need for taskers to pay for their own PPE, the potential for available tasks to suddenly drop without warning, and the lack of tertiary protections from illness provided to taskers such as workers' compensation and health benefits. As COVID-19 continues to be a reality, researchers should continue to evaluate how it impacts precarious and vulnerable workers such as gig workers. This can be done by studying the long-

term financial impacts for gig workers, as well as research related to the pandemic's impact on their mental health.

Another limitation is that all of the participants I had interviewed were currently working through TaskRabbit at the time of the interview and were willing to share their experiences. As a result, I may have missed some experiences of taskers who were discouraged from participating due to concerns about the potential repercussions if TaskRabbit were to discover their involvement. Also, I did not speak with any taskers who had since decided to quit working through the platform. It is important to recognize that as a result, my results may be biased in the sense that they do not likely reflect the experiences of taskers who had experiences that were negative enough to prompt them to leave TaskRabbit altogether. These constraints to the study's sample serve as a potential limitation of the study. This can be addressed by future research with taskers or other gig workers on their decisions to leave gig platforms. Indeed, past research has suggested that the perspectives of workers who have left an organization may be helpful in identifying ways to improve policies, provided that confidentiality is maintained (Williams, Harris, & Parker, 2008).

A final limitation is that due to my sampling strategies, I cannot declare with absolute certainty that all of the participants included in the study were, in fact, taskers. This is because my screening materials did not involve taskers providing a tasker profile or any other form of proof that they were active taskers. However, in order to combat this limitation, I asked each participant a number of technical questions about the TaskRabbit app, such as how each of the rating systems work. Based on their responses, I did not have any pressing concerns about whether any of the participants were genuine taskers. It should be noted that after I began data collection, I was made aware of an option for taskers to send potential clients their tasker profiles

on the app. I was not aware of this because the app prevents clients from searching for specific taskers, and the tasker must take the initiative to send the profile information. Using this feature would likely be a better screening tool for future studies with taskers.

Future Directions

Researchers can continue to investigate the nature of TaskRabbit work in a number of ways. As with any qualitative study, these results are not statistically generalizable to the tasker population in the same way that a quantitative study would be. Rather, the present study has naturalistic generalizability, which means that members of the population being studied may read the study's findings and make connections to similar conditions in their everyday lives (Stake, 1978). Furthermore, the qualitative nature of this study provides a necessary foundation that is deeply rooted in the experiences of taskers, with which further investigations can build upon. For example, a potential future direction for this study is to conduct a survey to capture a larger sample of the tasker population. I recommend that this study include questions about task boundaries such as taskers' boundary preferences as well as how they choose to enforce them. These could potentially be tested as moderators between task environment variables and health, safety, and stress outcomes, as is suggested by the conceptual model in Appendix 9. Additionally, it will likely be helpful to consider relevant personal identities such as gender, age, financial precarity, and access to health insurance outside of TaskRabbit. It is also important to consider that taskers' experiences likely vary considerably depending on the types of categories through which they accept tasks. Researchers should consider focusing on ways in which both taskers and the TaskRabbit company can reduce health risks, safety risks, and stressors for a broad range of taskers by being responsive and sensitive to the aforementioned individual differences. The findings from a quantitative survey will be more generalizable to the population,

and therefore can be used to develop more robust recommendations for taskers for how to navigate health and safety risks in their work.

Relatedly, a future direction for TWHTM is to conduct interventions to protect and promote the health, safety, and well-being of taskers. As described above, TWHTM interventions should focus on eliminating workplace health and safety hazards *before* moving on to promotion-related initiatives (see NIOSH, 2016). As such, the most important health and safety hazards to address in next steps are the restriction of taskers' abilities to take breaks, their exposure to ergonomic risks, and their exposure to interpersonal safety risks. Although it is considered to be less effective to rely on individual workers' behaviors to protect their own health and safety compared to organizational restructuring (Schill, 2017), focusing on individual changes may be necessary given the potentially low likelihood that TaskRabbit executives would be interested in investing in TWHTM interventions. As an alternative, TWHTM researchers have suggested that knowledge disseminated through communities may be a particularly important strategy for reaching gig workers (Schwatka et al., 2018). To protect workers' health, this knowledge can include information such as how to effectively take breaks while working, how to pursue health activities such as healthy eating and exercising, and setting other relevant task boundaries. To protect worker safety, researchers can disseminate suggestions for avoiding interpersonal safety risks, such as keeping a record of their location and cancelling tasks if needed. In terms of ergonomic risks, knowledge can be disseminated related to proper lifting techniques.

Furthermore, if TaskRabbit continues to neglect to provide taskers with free PPE, TWHTM researchers can consider developing these initiatives instead. These provisions can not only include PPE relevant to the COVID-19 pandemic such as face masks and sanitizer, but they

can also include PPE used in TaskRabbit work more generally such as back braces, knee pads, and safety glasses. It may also be helpful to provide supplemental training or educational materials on how to properly use PPE.

Outside of TWHTM, another approach that can be used in further research is a dyadic investigation of relationships of experiences between taskers and the clients who hire them to identify relative differences in interpreting specific work situations. This approach may facilitate a deeper exploration of the client-tasker relationship, which appears warranted given that client interactions were the most commonly reported stressor. The incorporation of clients' perspectives may shed light on why clients sometimes have expectations that taskers find to be unreasonable. This approach may also help in tackling other complex issues in TaskRabbit work, such as taking breaks while on the clock. Through the investigation of both taskers' and clients' perceptions of the same situations, researchers may be able to develop more realistic and widely accepted solutions for both parties.

Finally, future directions in research may include investigations of other topic areas within local, in-person labor services in the gig economy. A few participants indicated that other gig companies may create much worse environments in terms of health and safety compared to TaskRabbit. Examples provided by participants include, but are not limited to, Handy and Takl. For these other companies, participants alluded to problems such as increased difficulties with earning adequate pay and contacting support for safety concerns compared to TaskRabbit. Researchers may also consider conducting profile analyses based on task boundary preferences and/or identities held by gig workers to examine relative differences in work experiences. Dunn (2020) interviewed gig workers and created a typology based on worker motivations and

intentions, but this typology did not focus on relative differences in vulnerability to health and safety risks.

Conclusion. In conclusion, people who work for TaskRabbit and similar platforms do in fact appear to be a high-risk population for health and safety issues, and further investigation is critical. The goal of the present study was to not only investigate these issues, but also to raise awareness of them in the OSH literature and more broadly as well. This is the first study of its kind because it is the first to focus on TaskRabbit workers from a health and safety perspective. This is important because of its clear position as a unique platform within the gig economy. These findings both inform and provide justification for future health and safety research with TaskRabbit workers as well as other gig workers performing local, in-person labor services.

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Appendix 1: Final Interview Protocol

1. Introduction

“Hello, my name is Kiplin and I’m a graduate student in the psychology program at Colorado State University. I conduct research to find out about the experiences of people with unique work situations. I think that TaskRabbit is very interesting and would love to hear about your experiences with this kind of work.

This interview will last for roughly one hour. Before we begin, I need to obtain your consent to participate. I have sent you a consent form through your email. If you would like to pull it up, we can walk through it together.”

2. Background questions

- a. Why did you begin tasking?
 - b. How long have you been working for TaskRabbit?
 - c. What other responsibilities aside from TaskRabbit do you have, such as school or another job?
 - d. About how many hours do you perform tasks each week? (If it varies, ask about a typical week and how much it varies)
 - e. Is there a certain time of day when you tend to perform tasks?
 - f. What category or categories of work do you typically accept jobs for (ex: moving furniture, building furniture, delivery work, personal assistant work, etc.)?
3. What are some positive things about working for TaskRabbit?
- a. [Potential follow up: what do you like about working for TaskRabbit?]
4. What are some negative things about working for TaskRabbit?
- a. [Potential follow up: what don’t you like about working for TaskRabbit?]
5. What concerns have you had, if any, about your safety while working for TaskRabbit?
- a. [Can ask follow-up questions, such as whether the issue was reported to TaskRabbit; whether the participant experienced an accident or injury resulting in aches and pains for 7 or more days if they only mention interpersonal safety issues; do you know of anyone else who has had concerns about safety? What did they do about it?]
6. If you were to experience harm on the job, how would you handle it? Who do you think is responsible?
- a. [Can provide examples if the participant is having trouble answering: TaskRabbit company, the client, the tasker]
 - b. [Can probe about interpersonal safety and/or physical safety alternatively, depending on what they focus on]

7. What recommendations would you make to someone starting on TaskRabbit regarding any safety issues? Injury prevention?
8. How has your health been since you started working for TaskRabbit?
 - a. [Follow-up: Is your TaskRabbit work connected to your health in any way?]
 - b. [Can probe with questions asking about positive/negatives if only getting information on one or the other]
 - c. Additional probes:
 - i. Has your health improved since you started working for TaskRabbit?
 - ii. Does your work ever get in the way of things you might do for your health, such as eating healthy and exercising?
 - iii. How do you go about building breaks into your schedule?
 - iv. Was your work related to your health in other jobs you've done in the past?
9. How has your sleep been since you started working for TaskRabbit?
 - a. [Follow-up: Is your TaskRabbit work connected to your sleep in any way?]
10. What types of stressors do you have when doing TaskRabbit work?
11. How would you describe your experiences interacting with the online platform?
12. How has your TaskRabbit work connected with your quality of life?
13. COVID-19
 - a. How has your work changed since the COVID outbreak?
 - i. Have you changed what kinds of tasks you accept?
 - ii. Have you been able to get access to things like masks and gloves (if relevant to their work)?
 - iii. How has it impacted your ability to build your business on TaskRabbit?
 - b. If TaskRabbit work is slow/gone:
 - i. What are you doing now to make money?
 - ii. Have you thought about looking for unemployment? Have you had any success?
 - c. Do you plan to continue to work for TaskRabbit after the COVID outbreak is over?
 - d. Has TaskRabbit done anything about all this?
 - e. If you could say anything [to your company / to policy makers] about all this, what would you tell them?

14. What other things do you think I should know regarding working for TaskRabbit?

Transition, signpost *“Thank you for sharing your thoughts. Next, I am going to ask a series of short questions about your demographics. These questions are meant to help us get a sense for your background and where you’re coming from. This is important because we want to know who is represented in our study, and what kinds of experiences we may be missing. However, please be aware that you are not obligated in any way to answer any of these questions, and that these questions will not be used in any way to identify you. Does that sound okay?”*

15. Demographics

- a. In which U. S. state do you live?
- b. What is your age?
- c. How would you describe your gender?
- d. How would you describe your race and ethnicity?
- e. What is your highest level of education that you completed?
- f. “These next questions are related to finances”
 - i. Do you have health insurance? Who provides this insurance (e.g., your employer, Medicaid, etc.)?
 - ii. How much is your hourly rate on TaskRabbit?
 - iii. How much do you earn per month on TaskRabbit?
 - iv. What would you guess was your net income in 2019 from TaskRabbit after expenses like taxes and gas? *“By net income, I mean your take-home pay after taxes and any insurance or other deductions.”*
 - v. What would you guess is your net income from all of your jobs in 2019 (if applicable)?
 - vi. If you were faced with an emergency and had to come up with \$400, would that cause you financial difficulty?
 - vii. How much was your gross household income in 2019?
 - viii. What is your parents’ highest level of education completed? And income? *“What is your best guess for what your parents’ income is, in tens of thousands of dollars?”*

Transition, signpost, *“Thank you! Now I just have a couple more questions that will help us figure out how to get in contact with more taskers.”*

16. Recruitment questions

- a. How did you hear about this study?
- b. Do you know of a good way to get in contact with other taskers for future studies?

- c. Do you know any other taskers? If so, would you mind letting them know about the study? “After this interview, I will send you a follow-up email which you can forward to other taskers.”

“Thank you for taking the time to participate in the study. If you have any questions or concerns after we disconnect, please feel free to email me at taskworkerstudy@gmail.com. After we disconnect, I will send you a follow-up email with some links to different resources. If you experienced any stress or discomfort during the interview, please refer to these resources. You can also find them on our website [provide participant with website name].

Also, keep an eye out for this follow-up email as this is how you will receive your gift card as compensation for participating.

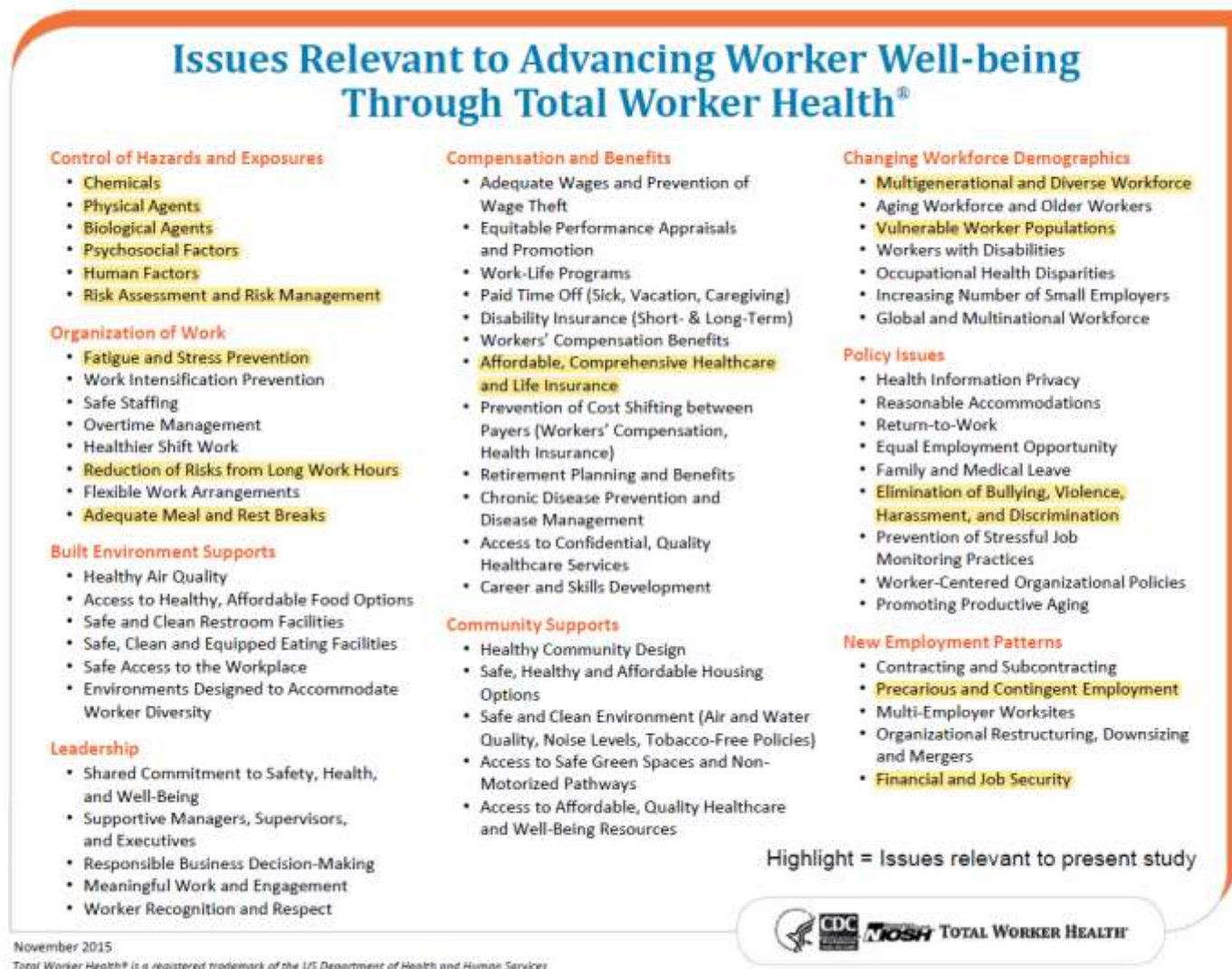
I just have one more question before you go. Would you like to be sent a final report of the study once it is finished? If so, I will keep your email on file, and I will send you a copy of the report once it is published.

Thanks again, and I hope you have a wonderful day.”

Appendix 2: TWH™ Issues Relevant to the Present Study

Figure 1

Issues Relevant to the TWH™ Model that are Addressed in the Present Study



Note. The issues listed in the figure that are highlighted in yellow represent the issues that are addressed in the present study.

The TWHTM approach is often represented by a summarized list of relevant issues, which was compiled in order to guide research and intervention efforts (Tamers et al., 2019). These relevant issues have been organized under nine major categories: control of hazards and exposures (e.g., chemicals, psychosocial factors), organization of work (e.g., fatigue and stress prevention, adequate breaks), built environment supports (e.g., healthy air quality, healthy food options), leadership (e.g., leader commitment to health and safety), compensation and benefits, community supports (e.g., healthy community design, access to healthcare), changing workforce demographics, policy issues (e.g., equal employment opportunity, elimination of harassment and violence), and new employment patterns (e.g., precarious and contingent employment, organizational restructuring) (Tamers et al., 2019). The present study specifically addresses control of hazards and exposures, organization of work, changing workforce demographics, policy issues, and new employment patterns. Within each of these nine categories are lists of more specific issues considered to be relevant to TWHTM.

Appendix 3: MTurk Survey Protocol

Q0 Please verify that you are a human participant [reCAPTCHA “I am not a robot” tool].

Q1 Where do you live (City / town, US state)?

City _____

State _____

Q2 What is your age in years? Please enter a numerical value (e.g., "6" instead of "six").

Q3 Which of the following companies have you heard of (if any)? Select all that apply.

Uber (1)

Lyft (2)

Airbnb (3)

TaskRabbit (4)

Fiverr (5)

DoorDash (6)

Wonolo (7)

I have not heard of any of these companies. (8)

Q4 Which of the following companies have you used as a customer? Select all that apply.

Uber (1)

Lyft (2)

Airbnb (3)

TaskRabbit (4)

Fiverr (5)

DoorDash (6)

Wonolo (7)

I have never used any of these companies as a customer. (8)

Q5 Which of these companies do you currently work for? Select all that apply.

Uber (1)

Lyft (2)

Airbnb (3)

TaskRabbit (4)

Fiverr (5)

DoorDash (6)

Wonolo (7)

I do not work for any of these companies. (8)

****If participants indicated that they currently work for TaskRabbit, they were redirected to the following set of questions. Otherwise, they were redirected to the end of the survey to receive compensation.****

Q6 How long have you worked for TaskRabbit?

- Less than 1 month (1)
 - Between 1 and 3 months (2)
 - More than 3 months (3)
-

Q7 How frequently do you perform tasks for TaskRabbit per month?

- Less than once a month (1)
- 1-4 times per month (2)
- 5-9 times per month (3)
- 10 or more times per month (4)

****If participants indicated that they have worked for TaskRabbit for three or more months AND they performed 10 or more tasks per month, they were redirected to a page**

with the following information. Otherwise, they were redirected to the end of the survey to receive compensation.**

Thank you for participating in this survey!

We are conducting online interviews with TaskRabbit workers to learn about health and safety risks in TaskRabbit work. Participation is entirely voluntary, and responses are confidential. Should you choose to participate, you will receive a \$40 gift card for your time. According to your responses to this survey, you are eligible to participate. Kindly refer to the flyer below for more information.

If you would like to participate, you can go to this link to get started:

<https://sites.google.com/a/rams.colostate.edu/task-worker-study>

You can also contact the study coordinator by email at TaskWorkerStudy@gmail.com or by phone at (970)-672-4405.

Appendix 4: Final Budget for Grant Funding

Table 1

Expenses	Total
Compensation for participants	\$1,360
Summer funding for primary investigator	\$3,473
CARMA qualitative research courses	\$650
Nvivo 12 Plus data analysis software	\$300
Rev Transcription Services	\$3,865
Skype temporary phone number	\$47
Advertising	\$1,054
Subscription for video creation service	\$94
Mturk survey	\$1,119
Zoom Subscription	\$64
Adobe stock photos for website	\$90
Compensation for Undergraduate RAs	\$500
Textbooks for RAs	\$330
Total expenditures	\$12,946.00

Appendix 5: Recruiting Taskers for Research

Through conducting my study, I discovered effective methods for recruiting local, in-person gig workers for research purposes, a challenging process for which best practices are underdeveloped. A population can be difficult to reach for multiple reasons, including low social or economic status (Shaghghi, Bhopal, & Sheikh, 2011), which may be relevant to gig economy workers (see Bajwa et al., 2018). For the present study, I utilized multiple recruitment strategies, collected information on which strategies are demonstrated to be the most effective and cost-efficient, and have reported my findings.

The following is a breakdown of the recruitment approaches I used and how effective they were. I utilized social media posts for recruitment purposes by posting on my personal social media accounts (i.e., Facebook, Instagram, LinkedIn) to ask if any of my contacts know any TaskRabbit workers, which did not yield any participants. I also created new social media accounts for recruitment purposes on Facebook and Instagram to use social media posts with relevant hashtags to spread awareness of the study, which again did not yield any participants. In addition, I tried recruiting participants through Amazon Mechanical Turk, a service through which workers can be hired to perform human intelligence tasks such as taking surveys (Amazon Mechanical Turk, Inc., 2019). I targeted 861 American survey-takers who lived in one of the major cities that had TaskRabbit workers. Participants were paid \$0.93 for the five-minute survey, in line with minimum wage requirements for the state of Colorado (Colorado Division of Labor Standards and Statistics, 2019). If participants indicated through the survey that they were eligible, I provided them with information on my study. See Appendix 3 for a copy of the MTurk survey questionnaire. This method resulted in the recruitment of one participant. I also utilized paid online advertising to promote our study through Facebook, Craigslist, and YouTube

advertisements. This method yielded at least 25 participants, making it the most effective approach. I posted flyers in the Denver metropolitan area in an attempt to reach local taskers as well, resulting in the recruitment of one participant. Lastly, I employed snowball sampling techniques by asking participants at the end of the interview to inform any other taskers whom they know about the study, which yielded at least one participant.

Based on my experience, the most effective strategy was a series of Craigslist ads in cities where taskers are located. The price of all the ads put together was \$51, which yielded 14 participants. However, it should be noted that taskers may be especially likely to use Craigslist compared to other gig workers, given that they often look for opportunities to perform in-person labor services. The second most effective, but much more costly recruitment strategy was a paid Facebook ad. A series of ads adding up to a total of \$571 yielded 10 participants. Another cost-effective strategy was hanging up several flyers in the Denver metropolitan area, although I only recruited one participant using this strategy. I also recruited at least one participant through snowball sampling. Although unanticipated, I also recruited one participant through a post on Reddit which was created to compile a list of paid Craigslist studies, including mine. A relatively ineffective recruitment strategy I used was YouTube advertising, for which a \$432 video ad yielded one participant. Lastly, the least effective recruitment strategy was an MTurk survey. I spent \$1119 to administer a screening survey to 861 participants. Out of everyone who participated, only seven people qualified for the study, and I was only able to successfully recruit one participant. It should be noted that five participants did not remember how they heard about the study, so the above results are not definitive.

I have a few additional observations for recruiting gig workers for research beyond what is described above. First, the effectiveness of any given paid advertisement strategy may partly

be due to the accuracy of targeting that is made available by that platform. For example, Facebook allows for the targeting of users who have expressed an interest in TaskRabbit on the platform at some point, but Instagram does not. YouTube allows for the targeting of specific videos, which could potentially be very powerful. However, YouTube accounts do not always allow advertisements to play before their videos (as was the case for TaskRabbit's YouTube channel). Beyond targeting precision, the best targeting strategy for a given study may also depend on the population that the researcher is aiming to sample from. Second, I recommend checking the local legislation about flyers before hanging them up in any metropolitan area, as some cities consider it to be a finable offense for littering. Finally, websites like Reddit and Facebook often have groups or forums where people with similar interests can communicate with each other, such as using TaskRabbit. However, these groups often have rules that ban researchers from using them as recruitment tools for their studies. I once made a Reddit account to enquire about the rules for the TaskRabbit subreddit and a couple other forums, which resulted in my account being suspended for suspicious activity. It is important to consider that users of these forums may find it invasive to be contacted for research purposes.

Appendix 6: Additional Methods Information

Pilot study. In order to assess whether the interview questions are capturing adequate information to answer the primary research questions, I conducted a pilot study with three participants from the target population. Data from subjects included in the pilot test were included in analysis as there were no initial revisions to the interview protocol. Partway through the interviewing process, an additional series of questions were added to include more effective probing questions about participants' health, as well as questions to address the COVID-19 pandemic in more depth. I obtained informed consent prior to all interviews, including pilot interviews. Because the pilot data was used in analyses, I obtained approval from the Colorado State University Institutional Review Board (IRB) prior to the pilot study.

Data Collection. Participants contacted me to participate in the study through either email or by phone. I scheduled the interviews via email, a process during which I also verified that participants were active taskers. Prior to the interview, I sent participants an email with an electronic copy of the consent form and the link to an online video chat meeting on Zoom, a widely-used online video chat application. A video interview approach was chosen for feasibility reasons given the geographic location of participants, and the need to make participation as easy as possible, as participants were likely to have busy schedules. Before we began the interview, I walked each participant through the electronic copy of the consent form and asked the participant to affirm that they understood everything, including the fact that they would be audio-recorded. I checked to make sure interviewees were still comfortable with the interview and recording process before I began recording. I also explained the purpose of the study and the specifics behind the confidentiality and disclosure of the data. I then used a scripted method to obtain verbal consent from the participant. Interview times ranged from roughly 20 minutes to 70

minutes, with most lasting 50 minutes to one hour. Video information from the interviews were recorded using Open Broadcaster Software, a free video-recording service.

A relatively consistent interview protocol was implemented across all iterations of the interviewing process, with the exception of some minor additions. These additions included adding more health-related probing questions to obtain richer data on that subject, as well as including questions about COVID-19 as its importance became more apparent over time. The first questions of the interview were related to establishing the participant's relationship with TaskRabbit, including questions about how and why they chose to work for the company, and what kinds of tasks they do and how often they do them. These kinds of questions are helpful in establishing context for further questions (Ritchie et al., 2014). In the next part of the interview, I asked questions relating to the primary research questions, along with follow-up questions. Towards the end of the interview, I indicated to participants that our time together is ending soon, giving them a chance to reflect, summarize, or bring up any additional material they think is relevant or important (Ritchie et al., 2014). A verbally-administered demographics questionnaire was placed at the end of the interview. I also asked a subset of participants for suggestions on how to contact other taskers. I asked how participants found out about the study, to gather information on which of my recruitment methods were the most successful. Finally, I concluded by asking participants if they would like to receive a copy of the finished publication once it is ready.

I took steps to ensure participants felt comfortable during the interview process, which is particularly important when asking about potentially sensitive topics. A possible issue with data quality is the reluctance of participants to express how they truly feel out of fear of negative consequences. To address this, I made an effort to establish a sense of trust early on by clearly

explaining the purpose of the study, a lack of connection to the TaskRabbit administration, and by guaranteeing confidentiality of responses. These steps are in line with best practices for qualitative interviews (see Ritchie et al., 2014). Interview questions were also arranged so that questions that establish rapport, such as background questions, are asked before questions eliciting potentially sensitive information, fostering comfort in participants (see Mealer & Jones, 2014). During the interview, I monitored respondent behaviors to detect discomfort and responded accordingly, as recommended by Kavanaugh and Ayres (1998). This is of particular importance to my research questions that may elicit sensitive information, such as questions about interpersonal safety risks. Additionally, at the end of the interview, I sent a follow-up email to participants with relevant resources in case they have experienced psychological distress during the interview process. These resources included information on the gig economy and the TWH approach, as well as contact information for the National Suicide Prevention Hotline (1-800-273-8255), the SAMHSA Treatment Referral Helpline (1-800-662-HELP), and the RAINN National Sexual Assault Telephone Hotline (800-656-4673). I also informed participants that they can refer to the study's website to find these resources.

Data Transcription and Cleaning. The interview recordings were transcribed verbatim with the use of Rev.com, which is a paid online transcription service. The website provides services from professional transcriptionists, who will transcribe the data by hand, with a stated 99%+ level of accuracy (Rev.com, N.D.). See Appendix 4 for a breakdown of the budget that will be used to fund this process and other expenses related to the study.

Three undergraduate assistants (RAs) cleaned the interview transcripts prior to analysis. To do this, they cross-referenced each of the transcripts with the corresponding video files to ensure accuracy. Then, they removed all identifying information from the transcripts. Identifying

information included participant names, names of other people, locations, addresses, and any other identifiers that might cause readers to recognize participants or people whom they are referring to. However, other information can also be used to identify individuals through processes of deduction, such as specific details of highly unusual or identifiable events (Kaiser, 2009). For this reason, I will refrain from reporting anecdotes or other information that is highly specific to a certain situation, to the point that the participant may be identified.

Data Analysis. Computer-assisted qualitative data analysis software (CAQDAS) was used as a primary tool for creating the codebook used to consolidate the interview data for analysis. The software chosen for this purpose was NVivo, a service that assists in the classification, sorting, and arranging of data (NVivo, Inc., N. D.). A primary benefit of using CAQDAS is that it creates a database that is easily searchable and allows for at-a-glance references to specific codes (Saldaña, 2016). This is useful for the process of codebook development and revisions. It should be noted that although NVivo has the capacity to algorithmically generate codebooks without human participation, it is not recommended to rely on CAQDAS for codebook development, as it does not serve as a sufficient substitute for human interpretation of qualitative data (Ritchie et al., 2014). Rather, it is best used as a tool for manual coding, which is how it was used in the present study.

I analyzed the transcribed interviews to begin creating a codebook, using best practices outlined by Saldaña (2013). Three undergraduate RAs and I analyzed the data and looked for themes to which we assigned corresponding codes. During codebook development, it is considered a best practice to involve multiple people, which may lead to conversations that facilitate the creation of a higher volume of richer codes (Oleson, Droes, Hatton, Chico, & Schatzman, 1994). However, I, as the primary investigator, took on the responsibility of creating,

revising, and maintaining the master list of codes, as recommended by MacQueen, McClellan-Lemal, Bartholow, and Milstein (2008). The analysis team met several times to discuss our varying coding strategies until an acceptable level of agreement was reached to develop the initial codebook (Saldaña, 2016). The codebook identified each code, which is defined by Saldaña (2016) as a word or short phrase that assigns an attribute to a selection of qualitative data. The codebook also specified a definition for that code and offer a framework for which all the codes are sorted into categories.

Once the preliminary codebook was created, I selected a single transcript which we all coded separately. This was done to determine interrater reliability, which I calculated using Cohen's Kappa. Although percentage rates of agreement have been used in the past, the practice has been criticized due to its inability to account for agreement based on random chance (McHugh, 2012). In contrast, Cohen's kappa has been widely used as an interrater reliability statistic (MacPhail, Khoza, Abler, & Ranganathan, 2016). After using the initial codebook, I found our levels of interrater reliability to be insufficient . After meeting with the RAs to identify the problems with the codebook and make revisions, I created a second version of the codebook. All of the RAs and I then coded a different transcript using the revised codebook. After this was completed, I re-calculated the interrater reliability and found an overall Kappa value of .85 between myself and all three RAs. This is considered a near-perfect level of agreement (Landis and Koch, 1977), which allowed us to continue with the coding process.

After a sufficient level of interrater reliability was established, we moved on to code the entire dataset. During this stage, it is recommended that at least two coders implement the same codebook on the entire dataset (Hruschka et al., 2004). Each undergraduate RA coded one third of the transcripts, and I coded all of them as well. After the undergraduate RAs and I coded all

the transcripts, I calculated the interrater reliability coefficients between myself and each RA. I then used that information to calculate the average Kappa between myself and all of the RAs combined, which is considered to be a proper method of estimating interrater reliability (Warrens, 2014). I found that our overall Kappa value for the entire dataset was .79, which is considered to be a substantial and acceptable level of interrater agreement (Landis and Koch, 1977).

I then subjected the data to a thematic analysis to address the primary research questions. The goals of analysis was to formulate detailed descriptions of the health and safety issues found in tasker work and to identify patterns in tactics used by taskers to address those issues. This is in line with best practices in interpreting qualitative data according to Ritchie et al. (2014). I took on an etic focus to the analysis, which means the themes I focused on (i.e., health and safety) were defined prior to analysis and considered largely universal in terms of interpretation across participants (Niblo, Mervyn, & Jackson, 2004). Thus, the codes formed during the coding process were synthesized and summarized to answer my three research questions.

Appendix 7: Final Codebook

Code Name	Definition	Inclusion Criteria	Exclusion Criteria	Example Quote
HEALTH				
Health activities	Participant discusses TaskRabbit in relation to healthy activities (ex: exercising, eating healthy, social activities with friends)	Include information on TaskRabbit getting in the way of these activities, as well as TaskRabbit offering improvements	Do not include information covered by the other health categories (i.e., mental health, breaks, etc.). Do not include information about participants being concerned about getting sick.	The work I do, I'm literally hammering, screwing, climbing, stooping, hauling all day long, so I would say it's- it's too much exercise.
Breaks	Participant discusses anything related to taking breaks while they are working through TaskRabbit	Include information on how participant goes about breaks and why	Do not include information about taking a break from the platform altogether.	If there's spaces between clients I, you know, it's organically, you could take a break. Um, um, but um, sometimes I'll probably have to eat in the car.
Mental health	Participant discusses anything related to mental health and their work	Include information on anxiety, loneliness, etc.	Don't include information about stress	most of the last four years, I haven't had co-workers, and that is like something I'm, like, used to in a way, but also sometimes it's like, you think that could be a m- a mental or just like emotional health thing.
Sleep	Participant discusses their sleep in relation to their work	Also include participants saying their sleep isn't impacted by their work	N/A	I mean, sometime when I have to go babysit at, um, someone's house when the parents come home late, I, I'm an early sleeper, so I sleep around 9:00 pm, but I've had to stay until midnight.

Benefits	Participant discusses not having benefits such as health insurance, workers' compensation, paid time off, etc.	Include participants stating they don't have benefits, expressing concern about benefits, or expressing that they are not concerned about it	Don't include participants discussing benefits in the context of responsibility (i.e., TaskRabbit, the tasker, etc.). If this is the case, code the information as "TaskRabbit's Role"	I wish we kinda would be able to get unemployment.
Pain - Type	Participant indicates they have experienced pain as a result of their job	Include information on what kind of pain they were experiencing (back pain, knee pain, etc.)	N/A	So I pulled like three muscles in one leg. And then that led to, uh, pulling a couple of muscles in the other leg. And I could barely hobble around.
Pain - How Long	Participant indicates how long they experienced a particular type of pain	N/A	N/A	That was for about a month.
Health - Misc	Any health-related information not included in the above categories	N/A	Do not include information about participants being concerned about getting sick.	I've become pretty much a master at herbal medicine (laughs)
SAFETY				
Safety Risks				
Chemical agents	Participant indicates exposure (or risk for exposure) to potentially dangerous chemicals	Include chemicals even if they are not classified as toxic by the CDC or any other regulatory agency	N/A	Yeah, just kind of like something to keep the, the, the bleach out, because bleach, I like to clean with bleach, but the smell of it gets in my throat.

Physical agents	Participant identifies exposure (or risk for exposure) to excessive noise, vibration, radiation, or extremes in temperature	Include participants discussing exposure to heat / cold even if it doesn't seem extreme enough to cause injury	Don't include information on risks that pose a threat to the participant's musculoskeletal system (i.e., ergonomic risks)	If I'm sitting there in the hot shade, moving parts out of a shed in like 95 degree weather and someone wants me to like clean walls or whatever in their house, clean baseboards, I'd be so worn out from the heat outside that there'd be no way I mean, I would be able to get it done in a timely matter, or something like that.
Biological agents	Participant identifies exposure (or risk for exposure) to bacteria, viruses, protzoa, parasites, or fungi	Include exposures that do not seem extreme enough to cause injury. Participants may call the risk of getting sick a "health" concern, but use this code anyways.	Do not include information about COVID-19	I got bedbugs once.
Ergonomic risks	Participant identifies physical conditions that may pose risk of injury to the musculoskeletal system (i.e., muscles, tendons, bones)	Include risk factors that may be directly harmful, such as heights, but also risk factors that may be harmful over time, such as frequent lifting. Include information on whether participants work with other people (other taskers, the customer, etc.) or if they work alone.	Do not include any potential risks to the participant's musculoskeletal system if they indicate that they're concerned that another person is/could be directly responsible for that risk (if this is the case, code as "interpersonal safety")	We were literally just, like, clearing up her garden of all these, like, stones, and like these plants, but it was just really steep edges and stuff.
Safety risks - Misc	Any general comments about safety or specific safety risks not	Include positive statements about safety	Prioritize all of the other categories before assigning this	Um, pretty much 99% of the time like no real concerns.

	captured in the above categories		code to a selection of data	
TaskRabbit's Role				
TaskRabbit's Role	Participant expresses who they think is responsible in the event that they experience an injury as well as who they think should be responsible in the event that they experience an injury	Include literal information (i.e., who they think actually is responsible for injuries) as well as information that is hypothetical (i.e., what they think the ideal situation should be). Include their answer even if they do not name a specific entity (it depends, I don't know, etc.). Also include information on who is <i>not</i> responsible and who should <i>not</i> be responsible	N/A	You can be certain that they would strictly disclaim any kind of liability as an employer.
Safety strategies				
App record	Participant indicates they use the app a way to record their activities for safety purposes	N/A	Only use this code if the participant indicates they use the app as a record specifically for safety reasons. If they indicate that they do it for other reasons (such as keeping track of payments), code the information as "app usage".	Um, and it helps draw more clients to the TaskRabbit app, because I won't work anywhere, except for through them, because it kind of ... where I have everything recorded. I could record all the messages, and everything like that. It kind of gives me a little bit of assurance, in case something would ever happen.

Equipment	Participant indicates that they use equipment while they are working, such as personal protection equipment (PPE), cleaning supplies, or other materials.	Examples of PPE include gloves, mask, back brace, glasses, knee pads, etc.	Do not include weapons such as guns.	usually I just try to like, if I know I'm gonna be bending I'll get like a back brace or you look at the jobs you're doing and you know you're gonna need like some type of protection then I would get that, you know based on the job.
Pay for PPE	Participant indicates that they pay (or did <i>not</i> pay) for their own PPE	N/A	N/A	No, I didn't pay for the gloves out of pocket.
Telling others	Participant tells someone that they know when and where they are doing tasks as a safety precaution	N/A	N/A	N/A
Work day or night	Participant indicates they only work during a certain time of day for safety reasons	Also include participants indicating that they are <i>not</i> concerned about working at a particular time of day due to safety.	Do not include participants talking about what time of day they choose to work <i>unless</i> they say that they do it for safety reasons (i.e., not for traffic reasons, sleep schedule, etc.)	That's what comes to mind is like the safety of just being a female and going into a stranger, a new place. That's why I choose, like, the daylight hours.
Location	Participant indicates that they only work in specific locations, or avoid certain locations, for safety reasons.	N/A	Don't include information on participants choosing particular locations for other reasons besides safety (for example, traffic)	Yeah, I said I stay within my city, so like I don't- Um, I don't like go explore in like, I kind of know like where, what is, so I don't feel afraid.
Safety strategies - Misc	Participant indicates they use a safety strategy not listed above	N/A	Prioritize the above strategies before using this code.	I carry a gun.
STRESS				

Interpersonal stressors				
Sexual misconduct	Participant reports instances instances that could be construed as potential sexual harassment or misconduct	Include instances that didn't necessarily happen, but the threat was there	N/A	And then they end up like, they end up, you know, asking for massages and stuff.
Client interactions	Participant describes interactions with their clients	N/A	Don't include information about clients giving bad ratings. Also don't include information about perceived threats to safety	there was 1 person who wanted me to clean their, their, their, their, their couch so I cleaned the couch, when I showed the, the person the-they started yelling and screaming
Interpersonal safety	Participant expresses that they consider another person (or people) to be a threat to their safety while they are working	N/A	Don't include information on potential sexual misconduct. Don't include information on participants being concerned about the safety of other people besides themselves.	That's, that's when people are like drinking and coming out of bars and stuff and it's really weird (laughs).
Algorithmic management				
Work hours	Participant indicates the volume or timing of work hours being a stressor or not	Include participants saying that they do not consider their work hours to be a stressor	Don't include information on participants stressed about getting to and from tasks or being late. Do not include information about work hours <i>unless</i> the participant indicates that they find the volume and/or timing to be stressful.	Yeah. It lets me sort of dip in, dip a toe in without a lot of commitment and allow me to control my risk without any repercussions.

Support	Participant discusses communications with the TaskRabbit company	Include information on participants' opinions, perceptions, and experiences of the support system. They may not necessarily call this communication with "support". Include all instances in which the tasker has either attempted or succeeded in having a back-and-forth communication with TaskRabbit about a specific topic related to them. Also include instances in which the tasker has chosen <i>not</i> to contact support.	Don't include information on TaskRabbit sending out mass communications to all taskers.	Like I've had some issues with like, various issues I've contacted them about and just seems like they're sort of not the best support.
5-star ratings	Participant discusses the 5-star rating system on the app (i.e., ratings of their job performance)	Include information on participants' opinions and perceptions of the rating system. Also include information about specific ratings, including ratings that they didn't think they deserved and/or didn't understand. Include information on participants saying they have never had a bad rating.	Do not include information on the other rating systems.	Yeah um, I definitely feel like there's, like a pressure to do high ratings.

Ratings for clients	Participant discusses the thumbs-up / thumbs-down rating system for the clients on the app	Also include information on how participants go about rating their clients	Do not include information on the other rating systems.	I think it, I feel like it's good as is.
Acceptance ratings	Participant discusses the rating system for how often they accept tasks	Include participants saying that they have not heard of this rating feature	Do not include information on the other rating systems.	Yeah that's definitely the most annoying/stressful part of the whole app, by far is the acceptance rate.
App usage	Any information on what it's like to use the TaskRabbit application.	Include comments about the app interface, as well as information on what it is like to work through an online application (ex: need to be on my phone a lot). Include information on participants attempting to explain how the app's inner workings impact their work experiences (i.e., the "algorithm"). Include information when participants are talking about how they go about using the app (i.e., as an advertisement tool, etc.)	Do not include information about specific rating systems	And there's so many factors in their algorithm that if, I may never have any idea why or why not I'm getting hired on a given day, so now, there's just not much inventive to be Elite at this point.
Other stressors				
Time stressors	Participant indicates that they find stress in time management, such as getting to tasks on time or finishing	N/A	Don't include information about transportation-specific stressors such as traffic.	Like I always wanna deliver, um, within that time but then sometimes expectations and, you know, like they

	on time.			say, expectations versus reality.
Transportation	Participant indicates that they find stress in transportation	Include information on driving, traffic, public transportation, etc.	N/A	So, or knowing you gotta drive home in the traffic, that's a stressor.
Good job	Participant indicates that they are stressed by trying to do a good job, or the best job that they can do.	Only include information if the participant indicates that doing a good job is a source of stress for them.	Don't include information on getting tasks done on time. Don't include information on taskers stating that they want to do a good job, but don't indicate that this is a stressor.	Um I would just say trying to get the job done correctly
Finances	Participant describes anything related to their financial situation	Include information on not having enough money, as well as having to deal with financial issues such as taxes. Information does <i>not</i> necessarily have to be related to stress.	N/A	Um, but definitely sort of just financial and like regularity, insecurity. Like that creates like my anxiety for sure. And I was like sort of figuring out like taxes with being an independent contractor, that creates a lot of anxiety too.
Stressors - Misc	Any stressors not captured by the above categories	N/A	Prioritize the above categories before using this one	N/A
BOUNDARY MANAGEMENT				
Boundaries	Participant expresses an expectation that they have related to their work (what they feel their responsibilities are, expectations for the client's	Include instances in which the tasker stood their ground, as well as instances in which the tasker chose to accept the boundary violation. An	N/A	I give myself a two time policy to where if I have to explain myself more than two times then I'm- I'm leaving.

	responsibilities, etc.). This can be thought of as a "line" that they have established in their work, which has the potential to be crossed by the tasker, the client, or by TaskRabbit. Also include instances in which the participant indicates a breach in a boundary they have established (i.e., the "line" was crossed)	example question for this code is "How do you go about deciding whether or not to accept a task"?		
Identities	Participant indicates that they have a particular identity, which is in some way related to their work	Include identities of whether someone considers themselves to be an independent contractor vs. an employee. Also include instances where someone brings up a demographic they have (ex: woman, chronic illness, etc.)	Don't include information from the demographics section of the interview.	I mean, I don't really say I work for, for, for, for TaskRabbit, I'm not like an, like a direct employee of, uh, corporate per, per se.
COVID-19				
COVID changes	Participant discusses ways that their work has changed since the COVID outbreak	Include information on ways they have changed how they go about their work, as well as ways that it has changed that they don't have control over. Also include information on other ways they have started making money	Don't include information on general concern about COVID	I used to drink the client's water, um, so I'm trying to kind of, uh, isolate myself from contact points and using things.

		during COVID besides TaskRabbit. Also include concerns that people have about COVID in relation to their work.		
TR and COVID	Participant discusses what TaskRabbit has done about the COVID outbreak	Include information on communications as well as direct action	N/A	I think there was a, uh, like a test, or not a test kit, like a kit to, um, to like, protect yourself.
Keep working	Participant discusses whether they will continue to work for TaskRabbit after COVID and why	N/A	Don't include participants expressing whether or not they want to keep working for TaskRabbit <i>unless</i> it is COVID-related	I really do. I like working for TaskRabbit, so I'll definitely keep working for them. Um, I just will probably be able to be a bit more cautious, like I said.
COVID advice - TR	Participant offers suggestions for how TaskRabbit could better handle the COVID outbreak	Also include participants saying they don't have any suggestions	N/A	Find a way to have, to have people come some-somewhat close to ma... working at full-time. So either by cutting off the application window, or, um, just not hiring as many people, or just give them that-that, uh, that opportunity.
COVID advice - policy	Participant offers suggestions for how the government (i.e., NOT TaskRabbit) could better handle the COVID outbreak (in regards to their situation)	Also include participants saying they don't have any suggestions	N/A	So, um, I would just say like, stop bickering and, um, just, just take it slowly, because we don't know this thing will come back like even like fuller force if you just start gathering in mass gatherings right now.

OTHER				
Quality of life	Participant discusses how TaskRabbit is connected to their quality of life	Include information on participants' lives being both better and worse as a result of TaskRabbit. Include instances of people discussing the flexibility of their work. Questions that often yield information on this code include "What are some positive things about working for TaskRabbit?" and "Does TaskRabbit ever get in the way of other things that you would do with your time?"	Prioritize other codes that are more specific (ex: health) before using this one.	You, like I said before, you're kind of exposing yourself to new people and new surroundings.
Advice	Participant offers advice to a hypothetical tasker just starting out on the platform	Also include participants saying they don't have any suggestions	Don't include advice for the TaskRabbit platform; just advice for other taskers.	Well, the, the biggest thing that I would always tell people is to do not communicate with people outside of the app, because you don't want to give your phone number out.
TR advice - general	Participant provides suggestions on how TaskRabbit can improve their operations	Also include participants saying they don't have any suggestions	Don't include information on how TaskRabbit should handle the COVID outbreak	Communicate with your clients and with us, and set up new standards and new fees for safety reasons. And train your people better.
TR communications	Participant discusses how TaskRabbit communicates with taskers, including disseminating information on	Include participants not knowing about policies (for example, not remembering what was said to	Don't include information on TaskRabbit communications in terms of COVID, or communications	There's, there's kind of like a lot of downward pressure communication from them. Like, "You'll get more clients if you

	policies	them during orientation)	about specific instances with particular taskers (i.e., support)	charge less," or, "The market rate is around \$19 an hour for a furniture assembly."
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Appendix 8: Additional Results

Additional Health Findings

Mental Health. Participants generally did not bring up the topic of mental health outside of stress, with a few exceptions. The infrequent references to mental health were largely positive. One Participant joined TaskRabbit after leaving a job she strongly disliked reported that her mental health had improved upon joining the platform. As a counterexample, a participant who primarily performed Ikea furniture assembly and expressed that he often worked alone, which he found to become draining. However, it should be noted that I chose not to ask participants questions specifically about their mental health to avoid being intrusive and damaging rapport. For this reason, it is unclear whether participants would have discussed mental health in more detail if they had been asked about it directly.

Sleep. When it came to sleep, participants primarily reported that their work was unrelated or even improved their sleep, with a few exceptions. Participants who reported that their sleep became better due to TaskRabbit largely attributed it to the ability they have to set their own schedules. A subset of these participants contrasted this with past jobs where they had to wake up early to go to work at a particular time, thus disrupting their sleep. However, in rare cases, participants did indicate that their work scheduling got in the way of their sleep. This would either be due solely to TaskRabbit work, or to the combination of TaskRabbit work with other jobs, as is described below.

There are some weeks where I'm exhausted because I do all day availability because you don't know when the tasks are going to come. A lot of people say "Oh, you're a freelancer, you get to work whenever you want." Well, you get to work when the clients

need you. So if I have a client that needs an evening, if they're having an event and I have to be there and then the next morning I have an early task, then I don't get enough sleep.

In addition, participants occasionally reported that their sleep was negatively impacted by their work through ruminating about future tasks while in bed. In the following quote, the participant explains that he ruminates about future tasks while in bed. The relative uncertainty of traveling to a new location and performing a new task may create a situation in which taskers spend time thinking about the future task in an effort to anticipate potential problems.

It does affect my sleep when I get a task. But it's 'cause of me, not because of TaskRabbit. I'm just like that. When I have a task that's a few days away, I get to thinking about it and I try to plan it all out in my head on how I'm gonna [do the task] and all the tools I need and all that kind of stuff.

Additional Safety Findings

Safety Strategies. A wide variety of strategies are used by taskers to protect themselves from the above safety risks, as well as from other people. Participants predominantly described methods they use to protect themselves from interpersonal safety risks. Typical strategies included using an app as a record for their location, telling another person where they are going, choosing to only work during daytime hours, and avoiding certain locations that they perceived as high-crime or otherwise dangerous. Participants also commonly alluded to simply being careful, evaluating the situation carefully before entering a task, and using common sense.

PPE. The use of equipment for TaskRabbit work appears largely unregulated. Taskers who used tools for their work all indicated that they use their own. They typically explained that this was because using their own tools was safer and more reliable than using whatever is made available to them on-site. In addition, participants also stated that they often use PPE when

necessary, such as gloves, masks, back braces, knee pads, and safety glasses. However, those who used PPE consistently reported that they paid for their materials out-of-pocket. A participant said that she asked for a fee up front for PPE specific to COVID-19 (i.e., masks, hand sanitizer, and alcohol), but it is unclear whether TaskRabbit would offer her any support if the client were to contest the expense. Although TaskRabbit has a policy in place that clients must reimburse taskers for items they purchase as a direct part of the task (TaskRabbit Inc., 2020), this policy does not extend to PPE reimbursement, which is generally considered to be the tasker's responsibility (TaskRabbit, Inc., 2019d).

Additional Stress Findings

There was an array of stressors that were often present beyond the stress from dealing with clients and algorithmic management. Of these miscellaneous stressors, the most common were related to time and transportation. Getting to tasks on time, dealing with public transportation and/or traffic, and getting tasks done on time were all perceived as stressful. A less commonly experienced stressor was related to doing a “good job”, either by the tasker's or the client's standards. Other participants noted that managing finances could be stressful for them. Finally, there were a few exceptional cases of taskers expressing that they did not find their work to be stressful at all. However, it should be noted that these participants typically performed tasks that did not involve physical labor, such as event management.

Participants' Recommendations for TaskRabbit

Participants had a number of recommendations for the TaskRabbit platform related to health and safety. Participants often commented that they would like to see more information about tasks before they accept them, such as the clients' ratings, the presence of animals on-site, and risk for contracting illnesses from others such as COVID-19. Others suggested a more

rigorous vetting and tracking system to protect taskers from risks such as interpersonal safety concerns. In terms of the 5-star rating systems, there was also the suggestion that taskers should be able to reply to their reviews, to allow them to provide their perspective on a situation in correspondence with the clients' account. A final suggestion that was provided was that TaskRabbit should allow taskers to cancel tasks for safety concerns without lowering their acceptance ratings.

When asked if they had any advice or requests from TaskRabbit regarding their handling of the COVID-19 pandemic, participants provided a number of additional suggestions. Some participants would have liked to see a screening tool or some other way for taskers and/or clients to identify themselves as high-risk, to avoid any unsafe levels of contact. Another suggestion by a tasker was to reset the acceptance ratings for taskers who suffered losses on that front from the pandemic. A tasker also advised that TaskRabbit should establish expectations about using proper PPE and social distancing when performing tasks by suspending the accounts of taskers who do not adhere to those guidelines. Other suggestions included providing free PPE to taskers, providing resources on ways to supplement taskers' income, and requiring clients to pay an upfront fee for taskers' PPE.

Appendix 9: Conceptual Model of the Task Environment

Figure 2

Conceptual Model of the Task Environment in Relation to Health, Safety, and Stress

