

Unboxing scheduling practices for U.S. warehouse workers

Lessons from a research and advocacy roundtable



May 2020 By Sam Abbott and Alix Gould-Werth



Washington Center *for* Equitable Growth

Evidence for a stronger economy

The Washington Center for Equitable Growth is a non-profit research and grantmaking organization dedicated to advancing evidence-backed ideas and policies that promote strong, stable, and broad-based economic growth.

Equitable Growth examines whether and how economic inequality—in all its forms—affects economic growth and stability, and what policymakers can do about it.

We work to build a strong bridge between academics and policymakers to ensure that research on equitable growth and inequality is relevant, accessible, and informative to the policymaking process. And we have the support and counsel of a steering committee comprised of leading scholars and former government officials. Members include Melody Barnes, Alan Blinder, Raj Chetty, Janet Currie, Jason Furman, John Podesta, Emmanuel Saez, Robert Solow, and Janet Yellen.

Since our founding in 2013, we have funded the work of more than 200 scholars and built a broader network through our working papers series, events, and convenings. By supporting research and bringing these scholars together to exchange ideas, we have learned a great deal and advanced a broad range of evidence-based policy approaches to addressing economic inequality and delivering broad-based economic growth to communities and families.

Key takeaways

- Research in the retail and service sector has been foundational to our understanding of scheduling practices and quality, but it may not be generalizable to warehouses.
- Researchers and advocates interested in warehouse scheduling must be cognizant of the broader context of the warehouse industry, such as variations in supply chains, outsourcing, and the use of new technology.
- Warehouse workers face serious challenges to their health and well-being due to unsafe working conditions and an overly taxing pace of work. These job-quality issues are intertwined with scheduling issues and should be studied in tandem.
- Replicating the developmental pathway of scheduling research in the retail and service sector will inform the field's understanding of warehouse scheduling and aid policymakers interested designing appropriate interventions.

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Forward by the authors

The research convening described in this report, as well the writing of the report itself, occurred in early February 2020. At that time, concerns about the spreading coronavirus pandemic and the subsequently swift and dramatic U.S. economic downturn were beginning to register among some policymakers. But the specific consequences evident today—a shattered U.S. labor force, severely disrupted supply chains, struggling businesses both large and small, and the upended everyday lives of millions of Americans—were only just over the horizon.

The coronavirus pandemic makes clear the essential role of warehouse workers in keeping our families safe, fed, and comfortable in times of crisis. The coronavirus and COVID-19, the disease it spreads, also expose the harrowing workplace conditions faced by many of the industry’s workers who must brave infection and possibly contracting a fatal disease.

As job quality in the U.S. warehouse sector gains prominence in the national dialogue, it is our hope that scheduling practices will be recognized as important in warehouse employees’ quality of life and quality of work. This report lays out the ways that scheduling intersects with other dimensions of job quality and charts a path for researchers hoping to engage with questions related to the warehouse workers who suddenly find themselves on the frontlines of the pandemic.

Overview

Workers in the United States struggle with low-quality work schedules.¹ The Fair Labor Standards Act is the main piece of labor legislation regulating work hours. The law, passed in 1938, protects workers from overwork by establishing a system of overtime compensation. Over the past 80 years, however, the nature of work scheduling problems has changed. Large numbers of workers in the United States face work schedules that are unpredictable and unstable. Many have difficulty amassing a sufficient number of work hours to pay the bills.

A growing body of research on “just-in-time” scheduling in the retail and service sector illustrates the consequences that bad work schedules have for people’s lives. But to advocate effectively for improvements in scheduling quality for *all* workers, more information is needed about contemporary scheduling problems across a wider range of industries.

This past February, the Washington Center for Equitable Growth hosted a convening of 26 researchers, advocates, and workers to discuss scheduling practices in the warehouse sector. By sharing research, ideas, and lived experiences, participants described an industry where workers often experience the volatilities and uncertainties inherent in the business, such as irregular spikes in supply or consumer demand, through problematic scheduling practices. As convening participant Beth Gutelius—an expert on the logistics industry, an associate director of the Center for Urban Economic Development at the University of Illinois at Chicago, and senior researcher at the Great Cities Institute—described, the nation’s supply and demand are reconciled on the warehouse floor, and workers often bear the risk of that reconciliation.

The goal of the February convening was to identify new avenues for research on schedule quality in the warehouse sector. Discussions at the convening informed the findings presented in this report. The first section presents a brief overview of scheduling quality based on research primarily conducted in the retail and service sector. To begin applying this learning to the warehouse industry, the next section discusses the role of the sector in supply chains and resulting market pressures. The third section considers how the pressures and peculiarities of the warehouse sector’s position in that supply chain may be affecting job quality and scheduling practices. We conclude by describing the path of research and interventions nec-

essary to advance our understanding of scheduling in the warehouse sector.

Taken together, these sections point to and support several key principles for scheduling researchers examining the U.S. warehouse sector:

- Research in the retail and service sector has been foundational to our understanding of scheduling practices and quality, but it may not be generalizable to warehouses.
- Researchers and advocates interested in warehouse scheduling must be cognizant of the broader context of the warehouse industry, such as variations in supply chains, outsourcing, and the use of new technology.
- Warehouse workers face serious challenges to their health and well-being due to unsafe working conditions and an overly taxing pace of work. These job-quality issues are intertwined with scheduling issues and should be studied in tandem.
- Replicating the developmental pathway of scheduling research in the retail and service sector will inform the field's understanding of warehouse scheduling and aid policymakers interested designing appropriate interventions.

Our February convening points the way toward expanding the knowledge base around scheduling in warehouses to help inform policymakers and firms seeking to improve productivity, safety, and well-being at this critical link in the U.S. economy's supply chains.

Problematic scheduling practices are widespread, affecting job quality and productivity

Research in the U.S. retail and service sector provides valuable insight into the causes, prevalence, and effects of problematic scheduling practices. To optimize labor costs, managers try to ensure that there are neither too many nor too few employees working to meet their customers' needs at any point in time. Many employees, therefore, find that their schedules are highly responsive to the perceived ebbs and flows of consumer demand, as well as decisions made further up the supply chain, such as the timing of product shipments. Their schedules are thus irregular and unpredictable.²

Employers have used new developments in technology to implement what are often called just-in-time schedules. Scheduling software now commonly used in the retail and service industry relies on algorithms that take into account product shipments, customer traffic, and even weather when setting and modifying schedules. Managers using these technologies are found to be overly sensitive to perceived changes in demand.³ This means that individual workers' schedules fluctuate even more than the consumer demand to which they aim to respond.

More researchers are turning their attention to scheduling as a component of work quality. As part of this emerging scholarship, scheduling expert and convening participant Susan Lambert, a professor in the School of Social Service Administration and director of the Employment Instability, Family Well-Being, and Social Policy Network at the University of Chicago, and her colleagues articulate five dimensions of scheduling quality that affect workers' well-being:

- Stability
- Predictability
- Timing
- Quantity
- Control⁴

To assess the quality of a schedule, one must look across all five dimensions. (See text box).

Five dimensions of scheduling quality



Stability refers to the consistency of the schedule. Is the schedule highly variable, or are the number of hours and time of work relatively consistent from week to week?



Predictability refers to the worker's knowledge of what his or her schedule will be before he or she is working it. Stable schedules are inherently predictable, but predictable schedules may still be unstable if the worker receives advance notice of highly variable hours.



Timing refers to the point during the day, week, or month a worker's hours are scheduled. Split shifts or "clopening" shifts may be examples of poor scheduling quality if the worker does not desire these work times.



Quantity refers to the number of hours worked. Ideally, the number of hours worked would be sufficient but not excessive, protecting the worker from both underwork and overwork.



Control refers to the level of input employees have into their schedules. Can workers provide input into the number of hours they work and the timing of those hours, and is there flexibility to change the schedule to match employees' needs?

A highly predictable schedule, for example, may be low quality if it includes many “clopening” shifts, where employees are assigned consecutive closing and opening shifts with minimal rest time in between. In contrast, a schedule that has nonstandard hours, such as overnight shifts, may be high quality if a worker exerts control and chooses that schedule because it fits his or her needs and preferences.

Unfortunately, many retail and service workers report schedules that cannot be considered high quality when looking across these dimensions. Approximately 70 percent of workers employed by large firms in this sector report last-minute shift changes; a majority have experience with clopening shifts; and a quarter report experience with “on-call” shifts, where an employee must be available for work but may not actually be called in to work.⁵ In addition to these undesirable hours and shift changes, employees often get very short notice of their work schedules, with two-thirds of workers in these firms reporting that they receive less than 2 weeks’ notice of their upcoming schedules.

By justifying just-in-time scheduling as a cost-control mechanism, firms may be overlooking the unintended human capital and business costs of these practices. Research by convening participant Kristen Harknett at the University of California, San Francisco and her co-author, Daniel Schneider at UC Berkeley, find that poor scheduling quality is associated with income volatility, household economic instability, and other measures of well-being, including psychosocial distress, issues with sleep quality, and general unhappiness.⁶ Low wages also are associated with these outcomes, but unstable and unpredictable schedules are more strongly associated.

Tired and unhappy workers are unlikely to be performing at their full potential. When the clothing retailer The Gap Inc. implemented an intervention designed to improve scheduling practices as part of a randomized control pilot study, workers slept better and were more productive at work.⁷ This productivity led to a 7 percent increase in profitability at the study’s treatment stores, suggesting both employees and employers could benefit from higher-quality schedules.

Research documenting the impact of scheduling quality on retail and service workers has led some firms to rethink their irregular scheduling practices and informed statewide and citywide ordinances advancing “fair workweek” legislation.⁸ There is, conversely, a relative dearth of research documenting scheduling practices in the warehouse sector. So far, only Chicago’s scheduling ordinance covers workers in warehouses, but the sector is included in the federal Schedules that Work Act and a comparable bill and campaign in New Jersey.⁹

As more fair-workweek advocates turn to the warehouse sector, there is greater need for research on scheduling practices in the industry and their effects on job quality.

Warehouse workers' position in the supply chain is likely to affect schedule quality

Recognizing the factors that contribute to scheduling practices in warehouses requires an understanding of the unique role the industry has in connecting products to consumers. In the most basic terms, a supply chain involves:

- Suppliers producing or procuring raw materials
- Manufacturers sourcing these materials from suppliers and then turning these materials into finished products for sale
- Distributors or retailers connecting products to consumers

The link between each one of these points is the warehouse sector, which stores, sorts, and prepares materials and goods for transport as they move along a vast array of different supply chains. (See Figure 1 on next page.)

All actors in supply chains have their own costs and risks associated with their role, but they also add to the value of the final products along the way. Producers of raw materials such as lumber, for example, may need to expend resources to mitigate the higher risk to worker safety, but the materials they provide are invaluable to manufacturers. Some of the costs and risks with which warehouse managers must contend include supply chain volatility, such as bouts of excess supply or excess demand, as well as other exogenous economic risks such as tariffs, trade wars, and public health crises.¹⁰

Warehouses are often thought of as a stopping point in supply chains that adds little economic value to goods. A product's value may increase during the manu-

Warehouses are key links in U.S. supply chains but face intense pressure to reduce costs, increase output, and shorten delivery time

This squeeze hits warehouse workers with longer hours and more dangerous working conditions

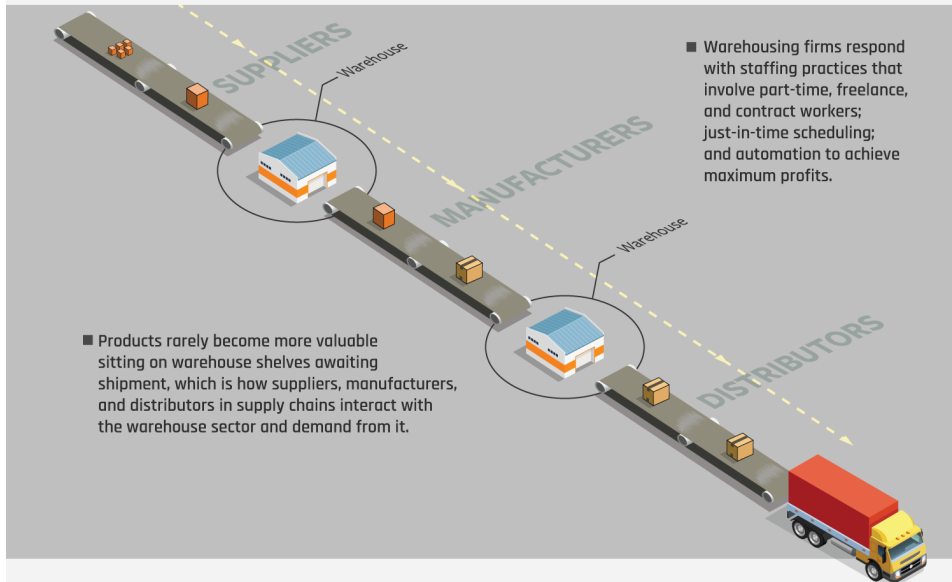


FIGURE 1

...a supply chain involves suppliers producing or procuring raw materials, manufacturers sourcing these materials from suppliers and then turning these materials into finished products for sale, and distributors or retailers connecting products to consumers...

Source: Authors' correspondence with warehouse and logistics experts.

facturing process or in a retail store when it is surrounded by attractive displays, a comfortable shopping environment, and knowledgeable sales staff. But a product rarely becomes more valuable sitting on a warehouse shelf awaiting shipment. This perception that warehouses add little value to a product influences how other suppliers, manufacturers, and distributors in supply chains interact with the warehouse sector and demand from it.

In an increasingly competitive market, warehouses face pressure to reduce costs, increase output, and shorten delivery time. A recent report by Beth Gutelius and her colleague at the University of Illinois at Chicago Nik Theodore, called “[The Future of Warehouse Work: Technological Change in the U.S. Logistics Industry](#),” provides a detailed review of how warehouses are adapting to evolving industry demands.¹¹

Over the years, the warehouse industry has responded to these dynamic risks and pressures by adopting new technologies and staffing structures. Advancements in [analytics and automation](#) are now used to increase profits by shortening the time that goods sit on shelves and to create popular [fast-shipping windows](#) that are now a selling point and staple in e-commerce.¹² While the use of automation has drawn significant [public interest](#), it is only part of the story.¹³

Firms also deploy staffing practices designed to increase flexibility for management, such as the use of [part-time workers, freelance workers, and irregular work](#)

hours.¹⁴ Some warehouses are following their retail counterparts in turning to algorithmic just-in-time scheduling software programs that promise to control labor expenses as a means of achieving greater profitability.¹⁵ Some researchers and advocates suspect that problematic scheduling practices could lead to similar insecurities for warehouse workers as those experienced by retail and service employees, but there needs to be more research on the effect of these practices on warehouse workers specifically.

In addition to just-in-time scheduling software, the warehouse sector has adopted other means of controlling labor costs that intersect with scheduling quality. Domestic outsourcing, where companies contract out specific roles in the production process so that workers are not directly employed by the firms for which they are working, is a growing trend across the U.S. workforce, and the warehouse sector is no different.¹⁶ Since the 1980s, more firms have opted to contract with third-party logistics companies to manage their warehouses.¹⁷ In 2019, more than half of spending on logistics overall was outsourced to these firms.¹⁸

One service that third-party logistics companies provide is the management of the warehouse workforce. Mirroring broader trends in the industry, many of these firms have turned to temp agencies to help provide their just-in-time labor needs.¹⁹ According to the U.S. Bureau of Labor Statistics, occupations within the warehouse sector have some of the highest composition of temporary workers of any industry.²⁰ Research suggests this type of workplace fissuring is associated with lower wages and worsening job quality.²¹ More research is needed to understand how outsourcing and the use of temporary workers impacts scheduling practices specifically.²²

The warehouse sector is not unique in the pressures it faces to minimize costs. Yet the industry's role as an intermediary between other actors in the supply chain may manifest in workers' schedules in ways that are unique to the sector, including increased demand for faster shipping times and the potential for the industry to place low value on human capital because individual workers are seen to add little to the product's overall value. Scheduling researchers can help shed light on these manifestations and point policymakers and advocates to appropriate interventions.

Scheduling practices in the warehouse sector intersect with other job-quality issues

Low-quality schedules do not exist in isolation—this job-quality issue intersects with other safety and quality-of-work concerns in the warehouse sector. One example of this intersection is the amount of hours demanded of warehouse workers, which is frequently higher than that of retail and service employees.²³ Standard shift length can be long: Amazon.com Inc., an industry leader, assigns 10-hour shifts. While retail workers struggle to amass full-time hours, warehouse workers are often assigned mandatory overtime. Even 40 hours of this physically demanding work can tax workers' health. When hours push past the 40-hour mark, some describe their schedules as “brutal” even as they appreciate the extra bump in their paychecks.

What's more, mandatory overtime around periods of high consumer demand can keep workers on the job up to 60 hours a week.²⁴ Because the overtime is mandated, workers cannot revert to full-time schedules without the risk of termination. In the parlance of scheduling-quality research, warehouse schedules are high in *quantity* of hours but low in levels of employee *control*.

Feelings of fatigue or even exhaustion stemming from overwork are not just quality-of-life issues. Tired workers may also be more prone to on-the-job accidents or other severe health incidences that stem from high-intensity, high-pressure jobs. Statistics from the U.S. Occupational Health and Safety Administration show that this sector has a nonfatal occupational injury rate nearly twice the private-industry average (4.5 percent, compared to 2.8 percent).²⁵ Investigative reporting suggests that specific warehouses and facilities may have even higher rates of serious injury, approaching 10 percent.²⁶

Of course, not all injuries can be attributed to overwork. It is probable, however, that the poor scheduling practices described by researchers and advocates are contributing to an environment where workers are forced to prioritize wages over well-being.

Workers unable to take on the long hours or the grueling pace of work²⁷ may find themselves pushed out of their jobs, if not directly fired. If workers are being assigned schedules that are unsustainable or incompatible with their home lives, then it may drive them to quit, potentially without the safety net of Unemployment Insurance or a new job lined up. Over the past decade, the Bureau of Labor Statistics' Job Openings and Labor Turnover Survey shows a steady increase in the level and rate of workers quitting their positions in the transportation, warehousing, and utilities industry while turnover due to layoffs or firings has increased more slowly.²⁸ (See Figure 2.)

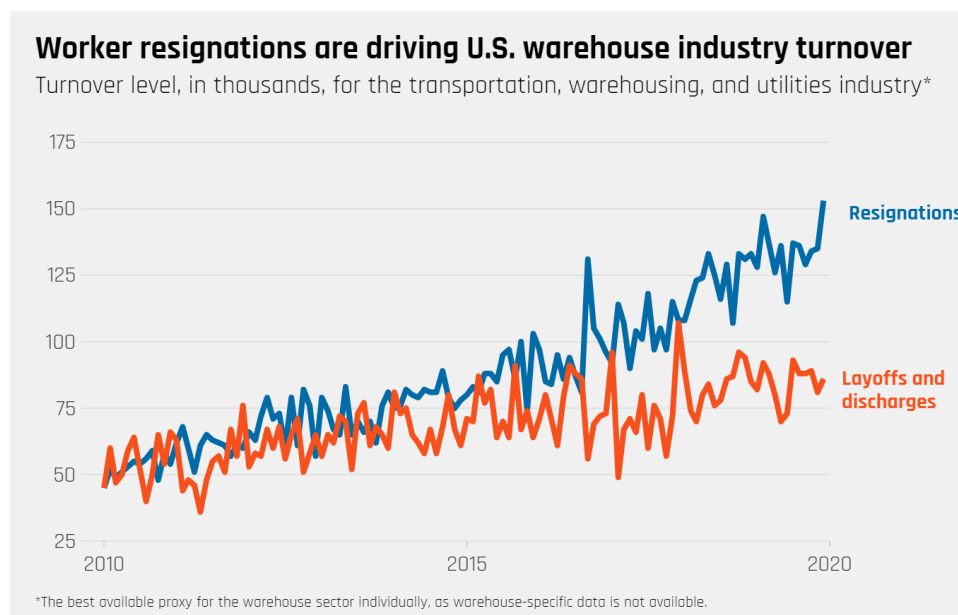


FIGURE 2

Over the past decade, the Bureau of Labor Statistics' Job Openings and Labor Turnover Survey shows a steady increase in the level and rate of workers quitting their positions in the transportation, warehousing, and utilities industry while turnover due to layoffs or firings has increased more slowly.

The role that scheduling plays in this turnover is not clear. On the one hand, workers across industries quit more often when there is confidence in the labor market, as has been the case in recent years.²⁹ On the other hand, research in the retail and service sector identifies a significant association between unpredictable schedules and employee turnover.³⁰ This has the potential to cause a vicious cycle in which poor-quality schedules drive some workers out of the industry, worsening the schedules for those left behind who must take on the additional work.

More research is needed to disentangle the relationship between scheduling quality and turnover in this industry. If scheduling is driving this increase in workers

Source: Job Openings and Labor Turnover Survey, data series JTS48009900LDL and JTS48009900QUL.

quitting, then it would imply that low-quality schedules have likewise increased in the sector over the past decades, which research has yet to identify.

Poor-quality schedules first and foremost impact workers, but they also are likely to have unintended consequences for businesses through increases in labor costs. The turnover discussed above results in significant costs for firms.³¹ Mandatory overtime might help firms meet consumer demand, but U.S. labor laws appropriately require time-and-a-half compensation for this work, making this business practice costly.³² Because warehouse work is physically taxing, worker productivity is likely to decline as consecutive hours of work increase. Thus, firms that rely on poor-quality schedules to cut costs could actually be paying more money for less productive workers—and exhausting their staff in the process. More research is needed to explore these links.

Expanding the knowledge base on warehouse scheduling will support firms and policymakers designing appropriate interventions

The field of scheduling research in the retail and service sector developed from a chain of four distinct yet related “types” of research could be replicated for the warehouse sector. They are:

- Type one, consisting of descriptive research documenting scheduling practices
- Type two, involving causal research to identify the consequences of these documented scheduling practices for workers and business
- Type three, involving the conceptualization and documentation of interventions to improve scheduling
- Type four, consisting of evaluations of these interventions

The relationship of these types is logical and not inherently temporal; it is not necessary that the research be conducted in the order described.

Taken together, research across these four types will expand the knowledge base on scheduling in warehouses and will inform advocates, policymakers, and firms seeking to improve scheduling practices. Let’s look at each one in turn.

Descriptive research

Reporting, testimony, and preliminary research suggest that scheduling in warehouses has issues across the five domains of scheduling quality: stability, predictability, timing, quantity, and control. Fundamentally, there remains a need for descriptive research on scheduling practices across the industry in these five scheduling categories. As researchers begin to unpack the scheduling realities of the warehouse sector, it is also an opportunity to assess whether the measures of scheduling quality (the five domains outlined above) are still applicable to warehouse workers or if new measures are needed.

Therefore, descriptive research must document scheduling practices as they unfold in the warehouse sector. Building upon the work of leading scholars in the field, researchers can structure their research questions around the five domains of scheduling quality identified above. Such research questions may include:

- How do shifts vary for warehouse workers? (stability)
- How far in advance do workers receive their schedules, and are last-minute changes common? (predictability)
- How common are nonstandard hours, such as overnight work, in the warehouse sector? (timing)
- How many work hours are typical per shift/day/week? (quantity)
- Are workers able to request shifts or modify their schedules to meet their needs? (control)

Of course, the warehouse industry is complex, so any descriptive research should look for heterogeneity-based factors, such as worker demographics, company type, job type, and other factors.

Descriptive research questions

What are the scheduling issues faced by workers in the warehouse sector?

Scheduling practices in the retail and service industry are well-documented, but what are the experiences of those in warehouses? How do warehouse workers fare in the five dimensions of quality scheduling: stability, predictability, timing, quantity, and control? Are there other unidentified domains unique to warehouses, in addition to the five identified above?

Causal research

Researchers also should engage in research on the causal implications of these scheduling practices and other business decisions by warehouse firms. While it remains challenging to identify watertight identification strategies in the scheduling context, a variety of research strategies have been used to move past description to shed light on the consequences of scheduling practices. This research attempts to shed light on causal linkages using randomized controlled trials and quasi-experimental methods

There are probably some unique aspects of the warehouse sector that affect scheduling practices, such as the prevalence of third-party logistics companies described above or the role of automation and artificial intelligence. Causal research could test whether variations in the structure of a warehousing workplace impact the type or frequency of low-quality schedules. Conceptually, this would involve models with a measure of scheduling quality as the dependent variable and workplace factors serving as the independent variables.

The second track of causal research should focus on the effects of scheduling practices on workers. Investigative journalists and worker advocates are starting to share stories of workers in warehouses and the conditions under which they work.³³ Scheduling practices factor into these stories about worker safety and the quality of work, but researchers can play an important role in disentangling the effect of scheduling quality specifically. Causal research could unpack how the documented scheduling practices uncovered in descriptive research are affecting worker's well-being on and off the warehouse floor.

The data necessary to conduct this kind of combined descriptive and causal research may be obtained from a variety of sources. In studying similar research questions in the retail and service sector, researchers could collect original data through worker/manager surveys obtained through social media recruitment or daily text messages, time diaries, focus groups, and interviews. Researchers also might be able to negotiate data-sharing agreements with individual warehouse and logistics firms, although accessing sufficient data to make cross-company comparisons may be onerous.

Then, there are third-party payroll firms. They may be able to provide a wealth of scheduling information across firms if sufficient data-sharing agreements can be negotiated. Among the leaders in the industry and their payroll services platforms are Automated Data Processing Inc.'s ADP Workforce Now, Kronos Inc.'s Kronos Workforce Ready, and OnPay Inc.'s eponymous payroll service.

Secondary data analysis using national surveys, despite some measurement concerns, also can help researchers study volatile work schedules if thoughtfully employed.³⁴ While multiple surveys contain questions that can provide insight into respondents' work schedules, identifying respondents working in the warehouse sector specifically and ensuring a sufficient sample size is one barrier to using nationally representative surveys.

Several key surveys, among them the National Longitudinal Survey of Youth 1997, the General Social Survey, and the Survey of Household Economics and Decisionmaking offer information on several aspects of scheduling quality, including measures of scheduling quantity, fluctuation, nonstandard work timing, predictability, and employee schedule control.³⁵ These surveys ask respondents to identify the industry in which they are employed, which can shed light on the type of work performed by respondents with unstable schedules.

Causal research questions

What are the factors impacting scheduling in warehouses?

Are there unique aspects of warehouses that affect scheduling practices such as outsourcing, supply chain structure, technology, inventory type, organizational structure and ownership, or collective bargaining arrangements? If so, how do these or other factors affect scheduling practices?

What are the impacts of scheduling for workers in the warehouse sector?

If there are documented scheduling issues in the warehouse sector, how are these issues affecting workers? Are these practices affecting health outcomes, childcare access, income volatility, career pathways, mental health, or other areas?

Documenting scheduling interventions

Workers, advocates, policymakers, and—to some extent—employers have recognized the negative consequences of poor-scheduling quality and taken action to ameliorate its negative effects. To date, interventions to improve scheduling policies have been informed by research in the retail and service industry, but warehouse workers have largely been excluded from the enacted legislation at the state and local levels thus far. That might change as more efforts to enact fair workweek legislation across the country and nationally have included protections for ware-

house employees. This interest in the scheduling practices of warehouse firms underscores the importance of high-quality research and the potential pathways, or tracks, interventions might take.

The first potential track for interventions is workplace-specific improvements to scheduling policies. Through collective bargaining agreements, grassroots organizing, and legal action, workers and advocates have pushed individual companies to change their scheduling practices. Among others, Gap, Starbucks Corp., Williams-Sonoma Inc., and Abercrombie & Fitch Co. have all announced changes to their scheduling practices, such as ending clopening and on-call shifts, though advocates question the degree to which some of these firms have followed through on their promises.³⁶

Some of the retail companies implementing these changes have, in part, been influenced by research linking improved scheduling quality with productivity and profitability. Expanding the knowledge base on scheduling in the warehouse sector may prompt a similar response by firms in this industry.

The second potential track for intervention is legislative. Thus far, most political energy around improving worker schedules has targeted municipal and state legislative bodies. Those that have passed legislation designed to provide workers with more stable, predictable, and adequate schedules are:

- New York City
- San Francisco
- Seattle
- Philadelphia
- Emeryville, California
- Chicago
- The state of Oregon

Efforts are underway in Massachusetts, New Jersey, and Washington state to pass similar legislation. The Schedules that Work Act has been introduced at the federal level.

As researchers begin documenting potential workplace and legislative interventions in the warehouse sector, it will be important to hear directly from workers

themselves. Poor scheduling quality has, in part, derived from the tendency to view workers as widgets that can be used or discarded erratically in order to control business costs. Researchers or policymakers considering interventions must avoid any similar tendencies. Focus groups, interviews, or worker advisors on research teams will help elevate the perspective of warehouse employees and could diversify the array of potential interventions.³⁷

Research questions to document interventions

What interventions to improve scheduling quality are being implemented in the warehouse and logistics sector?

Have firms in the warehouse sector adopted scheduling interventions piloted in other sectors, such as tech-enabled shift swapping, establishment of standardized shifts, core scheduling, designating a group of part-time-plus employees, and targeted additional staffing? Have they implemented new interventions tailored to the nature of warehouse work?

Are covered warehouse managers aware of and responsive to fair workweek ordinances?

For warehouses covered by fair workweek ordinances, such as those in Chicago, are managers aware of the new law? How well do managers understand the law's provisions? What supports are firms supplying to managers to help them comply with the law?

Evaluating interventions

The final link in the research chain examined in this report is evaluation of interventions. Much of the ongoing research on scheduling in the retail and service sector is focused on evaluating interventions, and some firm-specific evaluations have been effective tools in changing companies' scheduling practices.³⁸ Whether such evaluations can be completed in the warehouse space is dependent on firms' willingness to pilot scheduling interventions and partner with researchers.

Researchers from the Massachusetts Institute of Technology are proving that this kind of partnership is possible in the warehouse industry.³⁹ Leveraging the association with high-quality schedules and worker productivity and profitability may be

one way to encourage warehouse and logistics firms to support such research in their own sector.

With more jurisdictions adopting fair workweek legislation, it creates natural experiments for researchers to evaluate their effectiveness. Early evaluations of these ordinances are promising, but more research is needed to firmly establish the evidence base for these legislative solutions.⁴⁰ Only Chicago covers warehouse workers under its scheduling ordinance, so pending evaluations may have limited applicability in the warehouse sector. Researchers should prioritize warehouse-specific evaluations in Chicago or other jurisdictions that are now considering ordinances that cover this sector, such as New Jersey.

These evaluations also must consider how the power of workers, or the lack thereof, factors into the effectiveness of these interventions. An evaluation of Seattle's ordinance, for example, noted that structuring an ordinance in which enforcement is "complaint-driven" potentially diminishes compliance with the law compared to strategic enforcement.⁴¹ These ordinances put the responsibility on individual workers to alert the appropriate authorities to any compliance issues.

This requires workers to have both familiarity with the law's specific provisions and confidence in a process that allows them to make complaints without retaliation. Research indicates that unions can be an important enforcement tool, in part because they provide workers with an intermediary entity for reporting violations without fear of retaliation.⁴² Any evaluations of scheduling interventions, therefore, must account for the presence of unions or other forms of worker power. Interviews and focus groups with workers can also provide insight into how satisfied workers are with the interventions and serve as another tool for promoting worker voice.

Research questions to evaluate interventions

What are the outcomes for warehouse workers with new scheduling quality interventions?

Following the implementation of workplace-specific or legislative interventions, how have worker schedules changed across the five domains of scheduling quality (stability, predictability, timing, quantity, and control)? Do workers express satisfaction with these interventions? If scheduling practices have changed, has there been any impact on workers' hourly pay, income, or employment status? How have these interventions impacted other measures of worker well-being, such as safety on the job?

How are the outcomes for firms with new scheduling quality interventions?

How have firms responded to new workplace-specific or legislative interventions? Do firms report any unexpected costs or challenges in complying with interventions? Are managers and executives supportive of the changes? What supports from firms have improved compliance with scheduling interventions? How does the industry's role in the supply chain impact the efficacy of scheduling interventions?

Conclusion

As the warehouse sector in the United States continues to grow and faces more scrutiny on working conditions and worker safety, researchers and advocates are paying attention to the role scheduling practices play in the industry. As in the case of retail and service workers, the use of new technologies is changing the way work is scheduled, assigned, and distributed in warehouses.

The extent to which warehouse workers encounter similar scheduling issues to workers in the retail and service sector, however, remains an open question. In convening researchers, advocates, and workers, Equitable Growth continues its efforts to broaden understanding on scheduling practices across industries. The learning from this convening, summarized and supplemented above, highlights the unique aspects of the industry, as well as areas ripe for further study.

Building off this learning to expand the knowledge base around scheduling in warehouses will help inform policymakers and firms seeking to improve productivity, safety, and well-being at this critical link in the U.S. economy's supply chains.

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Endnotes

- 1 Heather Boushey and Bridget Ansel, “Working by the hour. The economic consequences of unpredictable scheduling practices” (Washington: Washington Center for Equitable Growth, 2016), available at <https://equitablegrowth.org/working-by-the-hour-the-economic-consequences-of-unpredictable-scheduling-practices/>.
- 2 Alix Gould-Werth, “How corporate headquarters could support store managers in providing predictable work schedule,” Washington Center for Equitable Growth Value Added blog, May 6, 2019, available at <https://equitablegrowth.org/how-corporate-headquarters-could-support-store-managers-in-providing-predictable-work-schedules/>.
- 3 Susan J. Lambert, “Fair work schedules for the U.S. economy and society: What’s reasonable, feasible, and effective” (Washington: Washington Center for Equitable Growth, 2020), available at <https://equitablegrowth.org/fair-work-schedules-for-the-u-s-economy-and-society-whats-reasonable-feasible-and-effective/>.
- 4 Susan J. Lambert, Julia R. Henly, and Jaeseung Kim, “Precarious Work Schedules as a Source of Economic Insecurity and Institutional Distrust,” *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5 (4) (2019): 218–257, available at <https://doi.org/10.7758/RSF.2019.5.4.08>.
- 5 Daniel Schneider and Kristen Harknett, “It’s About Time: How Work Schedule Instability Matters for Workers, Families, and Racial Equality” (Berkeley, CA: The Shift Project, 2019), available at <https://shift.berkeley.edu/its-about-time-how-work-schedule-instability-matters-for-workers-families-and-racial-inequality/>.
- 6 Daniel Schneider and Kristen Harknett, “Consequences of Routine Work Schedule Instability for Worker Health and Wellbeing,” Working Paper (Washington Center for Equitable Growth, 2018), available at <https://equitablegrowth.org/working-papers/schedule-instability-and-unpredictability/>.
- 7 Alix Gould-Werth, “Retail workers’ unpredictable schedules affect sleep quality: Evidence from the Gap,” Washington Center for Equitable Growth Value Added blog, March 19, 2019, available at <https://equitablegrowth.org/retail-workers-unpredictable-schedules-affect-sleep-quality-evidence-from-the-gap/>.
- 8 Jodi Kantor, “Starbucks to Revise Policies to End Irregular Schedules for Its 130,000 Baristas,” *The New York Times*, August 14, 2014, available at <https://www.nytimes.com/2014/08/15/us/starbucks-to-revise-work-scheduling-policies.html>; National Women’s Law Center, “State and Local Laws Advancing Fair Work Schedules” (2019), available at <https://nwlc.org/resources/state-and-local-laws-advancing-fair-work-schedules/>.
- 9 *Schedules that Work Act*, H.R. 5004, 116th Cong. 1 Sess. (2019), available at <https://www.congress.gov/bill/116th-congress/house-bill/5004/text>; *New Jersey Fair Workweek Act*, S. 921, 219th Legislature (2020), available at https://www.njleg.state.nj.us/2020/Bills/S1000/921_1.PDF.
- 10 Konrad Putzier, “E-Commerce Made Warehouses Hot. Trad War Could Cool Them Down,” *The Wall Street Journal*, September 17, 2019, available at <https://www.wsj.com/articles/e-commerce-made-warehouses-hot-trade-war-could-cool-them-down-11568718000>.
- 11 Beth Gutelius and Nik Theodore, “The Future of Warehouse Work: Technological Change in the U.S. Logistics Industry” (Berkeley, CA: University of California, Berkeley Center for Labor Research and Education, 2019), available at <http://laborcenter.berkeley.edu/pdf/2019/Future-of-Warehouse-Work.pdf>.
- 12 Vishnu Rajamanickam, “Working out warehousing challenges to face demand volatility and fast delivery expectations,” *Freight Waves*, February 22, 2019, available at <https://www.freightwaves.com/news/technology/working-out-warehousing-challenges-to-face-demand-volatility-and-fast-delivery-expectations>; Brian Baskin, “Amazon’s Free Shipping Pushes Small Retailers, Delivery Firms to Compete,” *The Wall Street Journal*, April 8, 2017, available at <https://www.wsj.com/articles/amazons-free-shipping-pushes-small-retailers-delivery-firms-to-compete-1491649203>.
- 13 Jason Del Rey, “How robots are transforming Amazon warehouse jobs – for better and worse,” *Vox*, December 11, 2019, available at <https://www.vox.com/recode/2019/12/11/20982652/robots-amazon-warehouse-jobs-automation>.
- 14 Ursula Holtgrewe, Jorg Flecker, and Annika Schonauer, “Flexibility and Restructuring of Value Chains: Findings from the WORKS Project.” Paper presented at the Sloan Industry Studies Conference (Chicago, 2009), available at <https://www.researchgate.net/profile/>

- [Ursula Holtgrewe/publication/228582935_Flexibility_and_restructuring_of_value_chains_findings_from_the_WORKS_project_links/54dc784focf2a7769d963e7e/Flexibility-and-restructuring-of-value-chains-findings-from-the-WORKS-project.pdf](https://www.washingtoncenterforequitablegrowth.org/publication/228582935_Flexibility_and_restructuring_of_value_chains_findings_from_the_WORKS_project_links/54dc784focf2a7769d963e7e/Flexibility-and-restructuring-of-value-chains-findings-from-the-WORKS-project.pdf).
- 15 Kronos Incorporated, “Kronos for Distribution” (2016), available at <https://www.kronos.com/resource/download/6816>.
 - 16 Kate Bahn, “Research finds that domestic outsourcing of jobs leads to declining U.S. job quality and lower wages,” Washington Center for Equitable Growth Value Added blog, August 21, 2019, available at <https://equitablegrowth.org/research-finds-the-domestic-outsourcing-of-jobs-leads-to-declining-u-s-job-quality-and-lower-wages/>.
 - 17 Rudolf Leuschner and others, “Third-Party Logistics: A Meta-Analytic Review and Investigation on its Impact on Performance,” *Journal of Supply Chain Management* 50 (1) (2013).
 - 18 John Langley, “2019 Third-Party Logistics Study” (Fremont, CA: Infosys Consulting, 2019), available at <https://www.kornferry.com/content/dam/kornferry/docs/article-migration//2019-3PL-Study.pdf>.
 - 19 Beth Gutelius, “Disarticulating distribution: Labor segmentation and subcontracting in global logistics,” *Geoform* 60 (2015): 53–61, available at <https://doi.org/10.1016/j.geoforum.2015.01.009>.
 - 20 Patrick Kilcoyne, “Occupations in the Temporary Help Service industry” (Washington: U.S. Bureau of Labor Statistics, n.d.), available at <https://www.bls.gov/oes/temp.pdf>.
 - 21 Bahn, “Research finds that domestic outsourcing of jobs leads to declining U.S. job quality and lower wages.”
 - 22 Annette Bernhardt and others, “Domestic Outsourcing in the United States: A Research Agenda to Assess Trends and Effects on Job Quality.” Working Paper prepared for the Future of Work Symposium (U.S. Department of Labor, 2015), available at <https://cepr.net/images/stories/reports/working-paper-domestic-outsourcing-2016-03.pdf>.
 - 23 U.S. Bureau of Labor Statistics, “Employment Situation: Table B-2. Average weekly hours and overtime of all employees on private nonfarm payrolls by industry sector, seasonally adjusted,” Press release, April 3, 2020, available at <https://www.bls.gov/news.release/empsit.t18.htm>.
 - 24 Isobel Asher Hamilton and Aine Cain, “Amazon warehouse employees speak out about the ‘brutal’ reality of working during the holidays, when 60-hour weeks are mandatory and ambulance calls are common,” *Business Insider*, February 19, 2019, available at <https://www.businessinsider.com/amazon-employees-describe-peak-2019-2>.
 - 25 U.S. Bureau of Labor Statistics, “Employer-Reported Workplace Injuries and Illnesses – 2018,” Press release, November 7, 2019, available at https://www.bls.gov/news.release/archives/osh_11072019.pdf.
 - 26 Will Evans, “Ruthless Quotas at Amazon Are Maiming Employees,” *The Atlantic*, November 25, 2019, available at <https://www.theatlantic.com/technology/archive/2019/11/amazon-warehouse-reports-show-worker-injuries/602530/>.
 - 27 Alexia Fernandez Campbell, “The problem with Amazon’s speedy shipping, in one graphic,” *Vox*, October 18, 2019, available at <https://www.vox.com/identities/2019/10/18/20920717/amazon-shipping-workers-injuries>.
 - 28 U.S. Bureau of Labor Statistics, “Job Openings and Labor Turnover Survey” (n.d.), available at <https://www.bls.gov/jlt/data.htm>.
 - 29 Raksha Kopparan and Kate Bahn, “JOLTS Day Graphs, December 2019 Report Edition,” Washington Center for Equitable Growth Value Added blog, February 11, 2020, available at <https://equitablegrowth.org/jolts-day-graphs-december-2019-report-edition/>.
 - 30 Joshua Choper, Daniel Schneider, and Kristen Harknett, “Uncertain Time: Precarious Schedules and Job Turnover in the U.S. Service Sector.” Working Paper (Washington Center for Equitable Growth, 2019), available at <https://equitablegrowth.org/working-papers/uncertain-time-precarious-schedules-and-job-turnover-in-the-u-s-service-sector/>.
 - 31 Veronica Donchez, “Warehouse Labor: The ‘Real’ Cost of Warehouse Worker Turnover,” Kane Logistics Consumer Goods Logistics Blog, May 21, 2019, available at <https://www.kaneisable.com/blog/warehouse-labor-the-real-cost-of-warehouse-worker-turnover>.
 - 32 U.S. Department of Labor, “Fact Sheet#23: Overtime Pay Requirements of the FLSA” (2019), available at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/whdfs23.pdf>.
 - 33 Chavie Lieber, “The human costs of Black Friday, explained by a former Amazon warehouse manager,” *Vox*, November 23, 2018, available at <https://www.vox.com/the-goods/2018/11/20/18103516/black-friday-cyber-monday-amazon-fulfillment-center>.
 - 34 Susan J. Lambert and Julia R. Henly, “Measuring Precarious Work Schedules” (Chicago: The Employment Instability, Family Well-being, and Social Policy Network, 2014), available at https://www.washingtoncenterforequitablegrowth.org/publication/228582935_Measuring_Precarious_Work_Schedules.

ssa.uchicago.edu/sites/default/files/uploads/managingprecariousworkschedules_11.11.2015.pdf.

35 U.S. Bureau of Labor Statistics, “National Longitudinal Survey of Youth 1997” (2018), available at <https://www.bls.gov/nls/nlsy97.htm>; NORC at the University of Chicago, “The General Social Survey, 1972–2018 v.2” (2019), available at <https://www.norc.uchicago.edu/gss/>; Board of Governors of the Federal Reserve System, “Survey of Household Earnings and Work Arrangements, 2019” (2020), available at <https://www.federalreserve.gov/econres/survey/sred.htm>.

36 Aditi Chakrabarti, “Striving for Scheduling Fairness at Starbucks” (New York: The Center for Popular Democracy, 2015), available at <https://populardemocracy.org/sites/default/files/The%2BGrind.pdf>.

37 University of Kansas Center for Community Health and Development, “Community-based Participatory Research” (n.d.), available at <https://ctb.ku.edu/en/table-of-contents/evaluate/evaluation/intervention-research/main>.

38 Joan C. Williams and others, “Stable Scheduling increases Productivity and Sales: The Stable Scheduling Study” (San Francisco: University of California, Hastings College of the Law, Worklife Law, 2018), available at <https://worklifelaw.org/projects/stable-scheduling-study/report/>.

39 Alex Kowalski, Erin Kelly, and Hazhir Rahmandad, “Scheduling practices for warehouse work” (Washington: Washington Center for Equitable Growth, 2019), available at <https://equitablegrowth.org/grants/scheduling-strategies-for-warehouse-work/>.

40 University of Washington West Coast Poverty Center, “The Evaluation of Seattle’s Secure Scheduling Ordinance: Year 1 Findings” (2019), available at https://www.seattle.gov/Documents/Departments/CityAuditor/auditreports/SSO_EvaluationYear1Report_122019.pdf.

41 David Weil, “Improving Workplace Conditions Through Strategic Enforcement” (Washington: U.S. Department of Labor, Wage and Hour Division, 2010), available at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/strategicEnforcement.pdf>.


42 David Weil, “Enforcing OSHA: The Role of Labor Unions,” *Industrial Relations* 30 (1) (1991); Mark Harcourt, Geoffrey Wood, and Sondra Harcourt, “Do Unions Affect Employer Compliance with the Law? New Zealand Evidence for Age Discrimination,” *British Journal of Industrial Relations* 42 (3) (2004), available at <https://doi.org/10.1111/j.1467-8543.2004.00328.x>.



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