The authors develop a model of cumulative disadvantage relating three axes of disadvantage for hourly workers in the US retail and food service sectors: schedule instability, turnover, and earnings. In this model, exposure to unstable work schedules disrupts workers’ family and economic lives, straining the employment relation and increasing the likelihood of turnover, which can then lead to earnings losses. Drawing on new panel data from 1,827 hourly workers in retail and food service collected as part of the Shift Project, the authors demonstrate that exposure to schedule instability is a strong, robust predictor of turnover for workers with relatively unstable schedules (about one-third of the sample). Slightly less than half of this relationship is mediated by job satisfaction and another quarter by work–family conflict. Job turnover is generally associated with earnings losses due to unemployment, but workers leaving jobs with moderately unstable schedules experience earnings growth upon re-employment.

Over the past 40 years, low-wage jobs with precarious working conditions characterized not only by economic vulnerability but also by temporal precarity have proliferated. In sectors such as retail and food service, which employ approximately 17% of American workers (Current Population...
Survey 2018), temporal precarity often manifests in two forms: unstable and unpredictable work schedules and high rates of turnover. The pervasiveness of schedule instability among low-wage workers and its well-documented negative consequences for worker health, family life, and economic well-being have prompted policymakers at the local, state, and federal levels to pursue fair workweek legislation that would require companies to provide advance notice of schedules and to compensate employees for last-minute schedule changes. At the same time, employment stability among low-wage workers is low. Retail and food service jobs have high turnover rates and workers frequently move in and out of unemployment. Thus, temporal precarity in these sectors is characterized not only by instability around how work time is allocated within jobs but also by uncertainty in how long employment relations will endure and when they may end.

Despite considerable evidence that schedule instability and turnover are two pervasive forms of temporal instability in low-wage work, few studies investigate how these two forms of instability may be related to each other. Prior research has documented associations between schedule instability and turnover at the establishment and individual levels (Lambert and Henly 2010, 2012; Kesavan and Kuhnen 2017; Williams et al. 2018). What remains less understood are the mechanisms linking schedule instability to turnover and the mobility consequences of turnover for workers leaving jobs with unstable schedules. While research has shown that schedule instability affects a number of outcomes that could lead to turnover, such as work–family conflict, financial hardship, and job satisfaction, it is not clear which, if any, of these factors lead to job separations. Moreover, separations from jobs with unstable schedules have uncertain implications for mobility. Workers may ultimately benefit from turnover if they find re-employment in higher-quality jobs. But, turnover among low-wage workers often comes with prolonged unemployment and re-employment in similar low-quality jobs (Lane 2000; Kim 2013).

We argue that schedule instability, turnover, and mobility are related in a cumulative disadvantage process (see DiPrete and Eirich 2006) by which exposure to unstable schedules disrupts workers’ family lives, work lives, and financial security, weakening the employment relation and ultimately leading to higher rates of job separations. We propose that turnover then leads to additional accumulated disadvantage in the form of lost earnings, both in the short run and in the long run. Our model draws attention to the micro-dynamics by which exposure to precarious work schedules amplifies disadvantage by straining employment relations, leading to separations, and exposing workers to a labor market with little opportunity for upward mobility.

We harness new longitudinal data to examine schedule instability as a predictor of job turnover and subsequent changes to earnings at a set of large retail and fast-food firms. Building on previous studies, we document the association between turnover and a broad and innovative set of
measures that capture workers’ exposure to last-minute and unpredictable scheduling. Then, we test the extent to which schedule instability affects turnover through its effect on work–family conflict, job satisfaction, financial hardship, and perceptions of supervisor fairness. Last, we investigate the mobility consequences of turnover for these workers by estimating the effect of turnover on earnings due to lost earnings during joblessness and due to changes to earnings upon re-employment. These empirical tests capture an important set of pathways through which initial disadvantage in work scheduling can accumulate through its persistent, negative downstream consequences.

Prior Research

Origins of Precarious Work

Prior research traces the origins of contemporary precarious working conditions to macro-level changes over the past four decades, such as declining unionization (Western and Rosenfeld 2011), financialization (Chan 2013; Appelbaum and Batt 2014), globalization (Beck 2000; Ross 2009; Kalleberg 2011), and reduced governmental regulation and oversight (Bernhardt, Boushey, Dresser, and Tilly 2008; Kalleberg 2009; Bernhardt 2012). These institutional, structural, and regulatory changes allowed firms to shift more economic risk onto their employees (Hacker 2006). Consequently, the United States saw a profound expansion of low-quality jobs characterized by low wages, few fringe benefits, non-standard employment relations, high turnover and short tenure, and unstable and unpredictable work schedules (Kalleberg 2011).

Temporal Precarity: Unstable Schedules and Short-Tenure Jobs

One consequence of the expansion of low-quality jobs is that low-wage hourly workers are increasingly exposed to temporal precarity within and between jobs. By temporal precarity, we mean instability and uncertainty surrounding both how workers can allocate their time between economic and non-economic activity while employed in a given job and regarding their chances of remaining employed at their current employer.

A key source of temporal precarity within jobs is employees’ work schedules. Practices such as providing workers limited advance notice of their schedules, holding workers on-call, adjusting hours at the last minute, and assigning highly variable hours week-to-week increase workers’ uncertainty about when and for how many hours they will be asked to work while allowing employers to more efficiently match labor to fluctuations in customer demand (Houseman 2001; Appelbaum, Bernhardt, and Murnane 2003; Cappelli and Neumark 2004; Carré, Tilly, and Holgate 2008; Lambert 2008; Lambert and Henly 2012).

Analyses of nationally representative data find that 25% of retail and 50% of food service workers work shifts outside of the standard daytime shift range (McMenamin 2007), and that roughly 15% of retail workers work
shifts with irregular timing (Golden 2015; Lambert, Henly, and Kim 2019). Other indicators suggest that schedule instability is even more prevalent. Nationally representative data show that approximately 40% of hourly workers have less than a week’s advance notice of their schedules, while estimates from studies of the retail and service sectors find that closer to two-thirds of workers have less than one week’s notice (Henly and Lambert 2014; Lambert, Fugiel, and Henly 2014; Lambert et al. 2019; Schneider and Harknett 2019a). Additional forms of schedule instability such as last-minute shift cancellations or timing changes, working on-call shifts, or working back-to-back closing and opening (“clopening”) shifts are common in retail and food service (Houseman 2001; Lambert 2008; Schneider and Harknett 2019a). More broadly, workers in these sectors have highly variable hours, with hourly employees experiencing week-to-week fluctuations in total hours of about one-third of their total usual hours worked per week on average (Lambert et al. 2014; Lambert et al. 2019; Schneider and Harknett 2019a).

Most workers find these variable and flexible scheduling practices undesirable. A majority would prefer lower-paying jobs with stable and predictable schedules over higher-paying jobs with irregular schedules (Lambert, Haley-Lock, and Henly 2012; Mas and Pallais 2017). Increasingly, employees work jobs with variable hours that they cannot control (McCrate 2012), and such unstable schedules are associated with fewer total hours worked and no compensating wage differentials (McCrate, Lambert, and Henly 2019). Rather than providing workers desirable flexibility, the benefits of just-in-time scheduling arrangements in low-wage work appear to accrue to employers, who can flexibly allocate labor to match customer demand by passing along instability to their employees (Lambert 2008).

Studies of precarious work have also identified high levels of employment instability among low-wage workers. Beginning in the 1980s, corporations experiencing increased competitive pressure and shareholder demands for higher performance at lower costs turned to strategic downsizing, restructuring, and streamlining to reduce costs (Useem 1993; Osterman 1999; Fligstein and Shin 2007; Uchitelle 2007). Retention rates and long-term jobholding began to decline as a result (Swinnerton and Wial 1995; Neumark, Polsky, and Hansen 1999; Farber 2010). These declines in job security have been most pronounced for lower socioeconomic status workers (Diebold, Neumark, and Polsky 1997; Farber 1998, 2010). Although the economy as a whole saw modest declines in job stability at the end of the 20th century, job insecurity and high turnover remain a prominent feature of low-wage work (Lambert and Waxman 2005; Lambert 2008; Carré et al. 2008; Lambert and Henly 2012). A substantial amount of turnover among low-wage workers is classified as “voluntary,” yet voluntary turnover in these sectors is often driven by employers’ building substantial amounts of instability into employees’ jobs with the expectation of inducing turnover, creating significant obstacles to long-term employment that blur the line between voluntary and involuntary turnover (Lambert 2008).
Work Schedules and Turnover as a Cumulative Disadvantage Process

The research above investigates unstable and unpredictable work schedules and short-tenure jobs as distinct indicators of precarious work. A cumulative disadvantage perspective on these aspects of precarious work, however, suggests that they may be linked in an ordered and causal process.

“Cumulative disadvantage” has taken on a number of definitions and operationalizations, but it generally captures a process whereby early relative disadvantage in some resource (e.g., income, wealth, job, education, or race) is amplified over time (see DiPrete and Eirich 2006 for a review). Models of cumulative disadvantage have been used to describe how early disadvantage begets future disadvantage in a variety of contexts, including career patterns (Rosenbaum 1979; Petersen and Morgan 1995; Maume 1999; Spilerman and Petersen 1999), educational attainment (Rosenbaum 1976; Gamoran and Mare 1989; Lucas 1999), and health (Ferraro and Kelley-Moore 2003; Ferraro et al. 2006). While many models of cumulative disadvantage describe how inequality on a single outcome grows over time, others trace how disadvantage propagates across a number of interrelated outcomes. This approach is particularly evident in models of cumulative disadvantage over the life course, which broadly argue that relative disadvantage early in life sets individuals on divergent life-course trajectories, and that inequality on those trajectories is amplified via social processes that penalize the already-disadvantaged (Elder 1985; Dannefer 1987; Sampson and Laub 1997; Singer, Ryff, Carr, and Magee 1998). For example, Sampson and Laub (1997) argued that the relationship between adolescent delinquency and adult criminal behavior is heavily mediated by the accumulation of social disadvantage through detachment from and antagonism with institutions such as schools, the family, peers, and the state.

We are similarly interested in tracing the processes that translate disadvantage in one arena into disadvantage in another, but on a shorter timescale. We conceive of the relationship between schedule instability and turnover as a social process whereby initial disadvantages in work schedule instability create hardship and conflict across domains of workers’ lives, weakening the employment relation and negatively affecting job stability and future earnings. We expect that disadvantage from schedule instability accumulates through its negative effects on workers’ family, work, and financial lives that, in turn, increase their likelihood of turnover. Further, we anticipate that turnover may have relatively negative effects on future earnings for workers who leave jobs with relatively unstable schedules. In this model, exposure to schedule instability produces and amplifies downstream economic inequality.

Pathways from Precarious Schedules to Job Instability

Whereas much of the turnover literature focuses on the psychological antecedents of turnover such as job satisfaction, withdrawal cognitions, and
organizational commitment (see Griffeth, Hom, and Gaertner 2000; Hom, Lee, Shaw, and Hausknecht 2017), our model of cumulative disadvantage contends that precarious working conditions both precede and affect workers’ psychological and material well-being, which in turn influence turnover. We have good reason to expect that schedule instability may induce turnover. Our study describes and tests four pathways through which schedule instability precipitates stress, conflict, and instability across multiple facets of workers’ lives and may thereby increase workers’ likelihood of turnover.

One pathway by which work schedule instability may lead to employment instability is through conflict between work and family life. Work–family conflict generally refers to inter-role conflict where the time demands of work interfere with one’s performance of family obligations (Netemeyer, Boles, and McMurrian 1996). Family obligations encompass a broad set of practices including, but not limited to, child care, elder care, cooking, shopping, cleaning, managing finances, and scheduling appointments (Hochschild 1989). Thus, operationalizations of work–family conflict will often ask respondents about family life generally and about specific types of family obligations (e.g., Thomas and Ganster 1995; Netemeyer et al. 1996; Cinamon 2006). Flexible scheduling policies that afford employees greater control and flexibility may reduce work–family conflict and turnover intentions (Thomas and Ganster 1995; Hammer et al. 2009; McNall, Masuda, and Nicklin 2009; O’Neil et al. 2009). But, such policies are rarely accessible for employees in the retail and fast-food service sectors. Unstable scheduling practices, such as non-standard hours and variable, unpredictable, and low-control schedules, are common in these sectors and often exacerbate work–family conflict (Pleck, Staines, and Lang 1980; Henly, Shaefer, and Waxman 2006; Henly and Lambert 2014). Unstable and unpredictable work schedules can produce instability at home by forcing parents to rely on ad hoc child care arrangements rather than formal or regular providers (Carrillo et al. 2017; Harknett, Schneider, and Luhr 2020). The conflict between being available to work irregular and unpredictable hours and providing care for children and other relatives may be especially strong for working-class women, such as those in retail and fast-food service, whose families rely on their income to get by and whose employers demand availability and punish those who take time off or prioritize unexpected family events over work (Gerstel and Clawson 2014). In turn, conflict between work and family life is a significant predictor of turnover (Boyar, Maertz, Pearson, and Keough 2003). Thus, schedule instability may precipitate turnover by creating work–family conflict.

In addition to challenging workers’ ability to meet their caregiving obligations, work schedule instability can lead to broader economic hardship. In the precarious work literature, we see that non-standard work and variation in hours are associated with lower earnings (Kalleberg, Reskin, and Hudson 2000; Dynan, Elmendorf, and Sichel 2012; McCrate et al.
(Finnigan 2018), and that unstable and unpredictable work schedules are associated with income volatility and household economic instability (Schneider and Harknett 2019a). Standard economic theories of turnover suggest that employees will quit when better wage alternatives are present (Jovanovic 1979; Topel and Ward 1992; Rogerson, Shimer, and Wright 2005). If just-in-time scheduling practices lower earnings and increase instability, and low earnings are associated with higher turnover, it seems likely that schedule instability may affect turnover through financial instability.

Beyond causing caregiving and economic hardship in workers’ home lives, unstable and unpredictable work schedules also create conflict in individuals’ work lives. Employees who have little control over their schedule and are not given their preferred shifts report lower job satisfaction (Aletraris 2010; Swanberg, McKechnie, Ojha, and James 2011), while employees with flexible and compressed workweek schedules report higher job satisfaction. Workers who are dissatisfied with their job may begin to perceive other employment as more desirable than their current job and develop withdrawal cognitions (Hom and Kinicki 2001; Mitchell et al. 2001). Prior research finds that structural determinants of turnover are at least partially mediated by job satisfaction (Kim, Price, Mueller, and Watson 1996; Gaertner 1999) and that low job satisfaction is a significant determinant of quit behavior among retail workers (Lucas, Babakus, and Ingram 1990; Clark 2001; Booth and Hamer 2007). Reductions in job satisfaction may then mediate the relationship between precarious schedules and turnover.

Finally, dissatisfaction with work scheduling practices can strain worker–supervisor relationships, eventually leading to turnover. Employees with greater control over their schedule tend to report feeling greater support from their supervisor (Swanberg et al. 2011). In the retail industry, worker control over schedules is low and supervisors’ discretionary allocation of flexible and desirable schedules to only some workers can strain worker–supervisor relationships (Henly et al. 2006). Employees who feel supported by their supervisor tend to quit at lower rates (Maertz, Griffeth, Campbell, and Allen 2007). Supervisors’ reliance on just-in-time work scheduling practices may cause unwanted instability in workers’ lives and deteriorate supervisor–worker relationships, leading to higher rates of turnover.

In sum, and in accord with a theory of cumulative disadvantage, these existing literatures suggest that unstable and unpredictable schedules are likely to precipitate turnover by increasing work–life conflict, economic hardship, job dissatisfaction, and feelings of unfair treatment at work.

**Mobility Consequences of Turnover**

Additional disadvantage may accrue to workers with unstable work schedules if their relatively high rates of turnover result in lost earnings or
re-employment in worse-paying jobs. Working in low-wage jobs tends to increase the risk of future unemployment (Stewart 2007), and unemployment for low-wage workers tends to last longer and significantly reduce workers’ annual earnings due to lost income (Lane 2000). The long-run consequences of turnover are less certain. Recent evidence from McCrate et al. (2019) suggests that hourly workers in Canada who quit and find a new job on average have higher wages and more hours than workers who keep their job. But, workers in the retail and food service sectors in the United States may have trouble finding new employment at better jobs. The availability of “good” low-wage jobs has declined over the past few decades (Kalleberg 2011). At the same time, the lowest-mobility parts of the low-wage labor market have expanded and mobility out of low-wage work has declined (Campbell 2012; Dwyer and Wright 2019; Schultz 2019), suggesting that turnover in today’s low-wage labor market is less likely to spur upward mobility because better options are relatively few. Moreover, evidence of the persistent, negative consequences of job displacement for earnings over the career (Jacobson, LaLonde, and Sullivan 1993; Stevens 1997; Kletzer 1998; Cha and Morgan 2010; Couch and Placzek 2010) suggests that low-wage workers who leave their jobs may also experience long-term earnings losses even after re-employment. Turnover among low-wage workers may not represent an opportunity for upward mobility, but rather an obstacle to achieving economic stability.

**Limitations of Prior Empirical Research**

Descriptive work has shown that low-wage hourly jobs are often characterized by both highly unstable work schedules and notably high rates of turnover (Appelbaum et al. 2003; Carré et al. 2008; Lambert 2008; Lambert and Henly 2012). Several important previous studies have also described an association between schedule instability and turnover. Managers in retail report that they believe schedule stability influences employee retention (Lambert and Henly 2010; Williams et al. 2018), but the evidence thus far has been limited. Scheduling practices and turnover appear to be related at the establishment level. Establishments in which managers keep low headcounts, account for employees’ scheduling preferences, provide advance notice of work schedules, and exceed hour allotments provided by their company have lower turnover on average (Lambert and Henly 2010; Lambert and Henly 2012). Individual-level analyses show mixed results. Kesavan and Kuhnen (2017) found that hour volatility is associated with turnover. But, in a randomized controlled trial, Williams et al. (2018) found no overall effect of schedule stability on turnover.

More work is needed to assess the effect of schedule instability on turnover. Although scheduling practices appear to affect turnover at the establishment level, individual-level associations between exposure to schedule instability and turnover cannot be inferred from establishment-level
associations without committing an ecological fallacy. Furthermore, prior research offers a limited operationalization of schedule instability. Weekly hour fluctuations and advance notice are certainly important and consequential forms of instability that create week-to-week uncertainty and unpredictability in work hours. We expand the scope of prior research by measuring individual exposure to a broad set of unstable scheduling practices that includes practices that create instability on a shorter time horizon, such as last-minute shift cancellations or timing changes. Further, while cumulative disadvantage theory suggests a set of mediating pathways connecting scheduling to turnover, we are not aware of any prior work that tests mediators of the relationship between unstable and unpredictable work schedules and turnover. Finally, we look downstream to the mobility consequences of turnover for workers leaving jobs with unstable schedules. With schedule instability pressuring workers out of their current jobs, and relatively few “good” alternatives, turnover may simply introduce turbulence into workers’ earnings and lead to re-employment in similar low-wage work, rather than provide an opportunity for upward mobility (e.g., Andersson, Holzer, and Lane 2005).

Hypotheses

We expect that unstable and unpredictable work scheduling practices will be associated with job turnover. We also expect that the relationship between unstable and unpredictable work scheduling practices and turnover will be mediated by caregiving and work–family obligations, job satisfaction, financial strain, and perceptions of fair treatment by one’s supervisor. Last, we expect that turnover from jobs with high schedule instability does not lead to upward mobility—rather, workers who leave their jobs because of an undesirable work schedule move to similar or worse-paying jobs to avoid temporal instability at work and its downstream consequences.

Data and Methods

Survey Data

The Shift Project uses targeted advertisements on Facebook to recruit retail and food service sector workers to complete an online survey that asks about their job conditions, demographic characteristics, economic security, health, and family life. The Shift Project survey has collected survey data from more than 50,000 workers employed at 120 of the nation’s largest retail and food service firms between 2016 and 2018.

The Shift Project’s approach to data collection uses advertisements targeted to US adults employed at particular large employers in the retail and food service sector. Because of the widespread use of Facebook among US adults, the Facebook sampling frame covers roughly 80% of the adult population, which compares favorably to some traditional sampling frames such as landline telephone service (Blumberg and Luke 2007, 2010; Link
et al. 2007; Busse and Fuchs 2012). The method of data collection and the data validation checks conducted by the Shift Project are detailed in a set of recent papers by Schneider and Harknett (2019a, 2019b). Although the Shift data come from a non-probability sample, Schneider and Harknett (2019b) showed that Shift respondents’ distribution on wages and tenure closely resembles that of respondents from similar target populations in gold-standard national, representative labor force surveys, including the 1997 National Longitudinal Survey of Youth (NLSY97) and the Current Population Survey (CPS). Moreover, Schneider and Harknett (2019b) demonstrated that the direction and magnitude of multivariate relationships in Shift data are similar to those found in the NLSY97 and CPS. Prior analyses of Shift data are also robust to using multiple weighting schemes and to corrections for selection bias (Schneider and Harknett 2019b).

This article draws on the panel study component of the Shift Project. This panel began in spring 2017 and consisted of 5,174 retail and food service sector workers in 30 large US companies. All members of the Shift Project panel survey were paid hourly and working for a large-chain retailer or food service employer when they were surveyed at baseline. Workers were employed in a variety of subsectors, including retail apparel, grocery, pharmacy, big box stores, fast food, casual dining, and other retail, but all worked for large national chains.

These workers were invited to complete a follow-up survey in fall 2017, on average seven months after baseline. Of the original sample of 5,174 workers, 2,408 (47%) responded to the follow-up survey, and 1,827 (35%) have complete data on all variables used in the main analyses. An in-depth discussion of the data structure and time-ordering of variables is included in Online Appendix A. We conduct an attrition analysis to gauge any potential biases that may result from non-response to the follow-up survey. We find that those who attrite from the panel differ from those who are retained on a few demographic characteristics, as well as on work schedule type and industry. We find little evidence, however, that attrition on these variables biases our results. These results are presented and discussed in Online Appendix B.

Key Variables

Dependent Variables: Turnover and Earnings

The key dependent variable in our analysis is job turnover. Turnover is coded 0 if a worker remained in the same job at follow-up and 1 if a respondent reports leaving their baseline survey job in the follow-up survey. Respondents who moved to a new job or who are jobless in the follow-up survey are both coded as 1 on the turnover measure. We are unable to distinguish between jobless respondents who are unemployed and those who have exited the labor force. In the main analyses presented, our measure of turnover captures turnover for any reason, and thus combines workers who
quit their jobs and those who were fired or laid off. We also conduct a parallel set of analyses for a narrower measure of job turnover, limited to those respondents who quit their baseline job (see Online Appendix B).

We also analyze *weekly earnings* at follow-up. Weekly earnings for hourly workers are defined by multiplying respondents’ reported hourly wages by their reported usual total hours worked per week. For workers re-employed in salaried positions at follow-up, weekly earnings are calculated by dividing reported monthly pay by 4.5. We are interested in both the short-run and long-run consequences of schedule instability and turnover on weekly earnings. To capture the immediate effect of turnover on earnings, we code jobless respondents as having $0 weekly earnings. However, we are also interested in respondents’ expected earnings once they are re-employed, so we conduct parallel analyses in which jobless respondents are coded as missing weekly earnings.

*Independent Variables: Work Schedule Instability*

We examine five measures of work schedule instability and unpredictability. *On-call* denotes if, within the past month, the respondent has been asked to be available to come into work with just a few hours’ notice or less. *Cancelled shift* records if the respondent’s employer has cancelled one of their scheduled shifts in the preceding month. Respondents who report working *clopening* shifts have worked a closing shift and then worked the next morning’s opening shift with less than 10 hours off in between shifts in the past month. Respondents with a *timing change* report that their employer changed the timing or length of their scheduled hours at some point in the past month. *Advance notice* is how far in advance respondents usually know what days and hours they will need to work; these times are grouped into categories of two or more weeks, one to two weeks, and less than one week. Survey items for these variables are reproduced in Online Appendix Table A.1 (hereafter, Appendix table numbers are prefaced with an “A” or “B”).

Variation in scheduling practices exposes employees to diverse forms of schedule instability. While schedule instability for some respondents may manifest as having short notice of schedule changes and last-minute shift cancellations, others may know their schedules well in advance but work on-call shifts without knowing when they will be asked to officially clock-in. Thus, if a respondent experienced one type of unstable scheduling practice, it may not be a reliable measure of general schedule instability. To capture the extent of respondents’ exposure to schedule instability across scheduling practices, we create a summary *instability scale*. This scale ranges from 0 to 5 and is defined as the sum of indicators for on-call, cancelled shifts, clopening shifts, timing change, and having less than two weeks advance notice. Correlations between components of the instability scale range from 0.05 to 0.17 (see Table A.2). In the following analyses, we collapse the instability scale into three levels: exposure to 0 types of instability, 1 to 2 types of
instability, and 3 to 5 types of instability. We determined cutoffs for each category based on similarities in observed associations between each level of the instability scale and the dependent variables in the following analyses. Collapsing the instability scale into three levels does not change our substantive findings.

**Mediators**

We use two scales and two single-variable mediators in the mediation analyses (survey items are presented in Table A.1). The caregiving and work–family conflict scale is created by summing a respondent’s response value on each of three measures of how a respondent’s job affects their ability to attend to their “family needs” or “personal needs” and standardizing to a mean of 0 and variance of 1 ($\alpha = 0.78$, Table 2).

Next, we develop a financial strain scale comprising 10 variables. The first item of the financial strain scale asks how confident the respondent is that they could come up with $400 within the next month, a benchmark used by the Federal Reserve Board to indicate economic insecurity (Federal Reserve Board of Governors 2018). The second item asks respondents to rate how difficult it is for them to cover their bills and expenses. The third item asks respondents to report how volatile their income is. The remaining items measure exposure to different forms of material hardship and are described in Table A.1. Responses to these items are summed and standardized to create the financial strain scale ($\alpha = 0.76$, Table 2).

We also use two single-variable mediators. Job satisfaction is a four-level categorical measure of respondents’ self-reported job satisfaction. Supervisor fair treatment is a four-level categorical measure of whether the respondent perceives their supervisor as treating them fairly.

**Control Variables**

All analyses control for demographic characteristics, including race, gender, if the respondent has children, age, education, school enrollment status, and marital status. We also control for job characteristics, including tenure, managerial status, and industry. To ensure that our analyses capture the effect of schedule instability on turnover rather than the effect of total hours respondents usually work, we control for the extent to which the respondent would prefer to work more hours. We also control for respondents’ input into their schedules to account for the extent to which seemingly unstable schedules are driven by employer versus employee preferences. We control for weekly earnings measured at baseline. We account for how long each respondent has been in the risk set for turnover by controlling for job tenure at first contact and length of time between first and second contact. Fixed-effects analyses control for time and person fixed effects. Unfortunately, our other controls do not sufficiently vary between periods to be included in the fixed-effects analyses. We also estimate models
using the Heckman (1979) correction to address sample selection bias attributable to missing earnings data for respondents who are jobless at follow-up and use the respondent’s household’s dependency ratio to satisfy the exclusion restriction criterion. The dependency ratio is the ratio of children to total people in the household and calculated as total number of children/(total children + spouse + respondent).

Analytic Approach

Effect of Schedule Instability on Turnover

First, we fit discrete-time logistic regression models predicting turnover using one work-scheduling variable at a time as a predictor:

\[
\logit(TURNOVER_{it} + 1) = \beta_0 + \beta_1(WS)_{it} + X_{it}\gamma
\]

where WS is on-call, shift cancellation, clopening, timing change, advance notice, or the instability scale. A vector of covariates, \(X_{it}\), includes age, race, gender, if a respondent has children, education, school enrollment status, marital status, job tenure, respondent’s preference for more hours, schedule control, weekly earnings, if the respondent is a manager, industry, and time between interviews. To summarize the relationship between work schedule instability and job turnover, \(\beta_1\) is of primary interest.

Mediation Analyses

Next, we test for mediation in the relationship between work schedules and turnover. We use the instability scale as our measure of unpredictable and unstable work schedules in the mediation analysis because this is our most comprehensive measure of schedule instability and because using a scale will tend to reduce measurement error compared to using single items. We test if the relationship between the instability scale and turnover is mediated by four potential mediators: the caregiving/work–family conflict scale, job satisfaction, the financial strain scale, and perceived supervisor fairness. We decompose the total relationship between the instability scale and job turnover, net of controls, into direct and indirect effects. The direct effect of schedule instability is the remaining association between schedule instability and turnover, net of controls and holding the mediators constant. The indirect effect is the component of the total effect of schedule instability on turnover that acts through the hypothesized mediators.

We are interested in assessing the statistical significance of the indirect effect. This assessment entails testing if the effect of instability on turnover in Equation (2) is significantly different from the effect of instability on turnover in Equation (3), that is, if \(\beta_1 - \gamma_1\) is significantly different from 0:

\[
\logit(TURNOVER_{it} + 1) = \beta_0 + \beta_1(INSTABILITY)_{it} + X_{it}\delta
\]
Because we employ a nonlinear model to predict turnover, a binary outcome, we cannot use standard methods (e.g., Baron and Kenny 1986) to directly test the difference in coefficients $\beta_1 - \gamma_1$. Coefficients cannot be compared across nonlinear models because of rescaling, whereby coefficient estimates are affected by differences in the error variance between models (Mood 2010). Direct comparisons of coefficients in nested nonlinear models therefore cannot distinguish between changes in coefficients attributable to confounding (mediation) and changes attributable to rescaling. Instead, we use the Karlson, Holm, and Breen (KHB) method, which allows for the decomposition of total effects into direct and indirect effects in nonlinear models, net of control variables (Karlson and Holm 2011; Kohler, Karlson, and Holm 2011; Karlson, Holm, and Breen 2012; Breen, Karlson, and Holm 2013). The KHB method decomposes the change in coefficients into components attributable to confounding by mediators and to rescaling. Karlson, Holm, and Breen (2012) also derived a test statistic for the mediation analyses based on the delta method (Sobel 1982). KHB mediation analyses were conducted using the user-written -khb- command in Stata (Kohler, Karlson, and Holm 2011).

The KHB method has two additional benefits for our analyses. First, KHB can control for other confounders. Our mediation analyses use the same controls as the regressions of turnover on schedule instability presented in Equation (1). Second, KHB can handle multiple mediators at once, allowing the researcher to measure mediation by a vector of mediators and then assess the degree to which each mediator contributes to the total effect. These analyses allow us to quantify how much of the relationship between schedule instability and turnover is explained by each of the four potential mediators.

Earnings Analyses

We are also interested in assessing if turnover leads to upward mobility and the extent to which the gains from turnover differ between workers leaving jobs with stable and unstable work schedules. Our outcome of interest is change in earnings between baseline and follow-up. We use two measures of change in earnings. First, we code respondents who are jobless at follow-up as $0$ earners in order to capture the immediate negative consequences of turnover on earnings due to joblessness. Then, we code jobless respondents as missing earnings data and attempt to estimate the effect of turnover on respondents’ earnings at their next job. For both outcomes, we estimate ordinary least squares (OLS) and fixed-effects models of change in weekly earnings regressed on turnover. The OLS models take the following form:
where $\beta_1$ is an estimate of the difference in change in earnings between respondents who leave their job between baseline and follow-up and respondents who did not, $X_{it}$ is a vector of controls measured at baseline, and $\epsilon_i$ is the error.

The fixed-effects models are specified as follows:

$$
\Delta(EARNINGS)_{it} = \beta_1(\Delta EMPLOYER)_{it} + \alpha_i + \eta_t + \Delta \epsilon_{it}
$$

where $\Delta EARNINGS$ refers to the within-respondent change in earnings between baseline and follow-up, and $\Delta EMPLOYER$ indicates if a respondent stayed with the same employer or changed employers. We also control for individual fixed effects, $\alpha_i$, and time fixed effects, $\eta_t$. The coefficient of interest is $\beta_1$, which captures the average change in earnings respondents experience due to changing employers, net of time effects and time-invariant individual characteristics.

Last, we use a Heckman-style correction to address sample selection bias attributable to missing data on earnings for jobless respondents. In our context, the Heckman model jointly estimates a selection equation for being employed and a corrected earnings function through maximum likelihood estimation. Estimating the selection equation requires at least one variable that satisfies the exclusion restriction, meaning that the variable predicts re-employment but does not determine earnings. Family structure variables are commonly employed in applications of the Heckman selection model to labor force participation (e.g., Heckman 1977; Heckman and Macurdy 1980; Dolton and Makepeace 1987). We use the respondent’s dependency ratio, defined as the ratio of children to adults in the household because we know that the number of children affects parents’ labor supply (e.g., Angrist and Evans 1998), but we do not expect that the number of dependents affects earnings. Dependency ratio is a significant predictor of selection into re-employment in our sample. The selection equation estimates a respondent’s likelihood of re-employment using all controls from Equation (4) plus the respondent’s dependency ratio; the earnings equation estimates Equation (4), adjusting for sample selection bias estimated in the selection equation.

In addition to the above specifications, we are interested in whether the effect of turnover on weekly earnings varies between respondents who leave jobs with relatively stable and relatively unstable work schedules. For example, if employees find it difficult to cope with high schedule instability, they may be willing to take a new job with lower pay in exchange for a more stable schedule. We estimate Equations (4) and (5) and the Heckman model this time with interactions between turnover and the instability scale as measured at baseline. We test if the interaction between instability and turnover is significant, and we estimate the effect of turnover on weekly earnings at each level of the instability scale.
Results

Descriptive Statistics

Our sample of retail and food service workers experienced a high degree of exposure to precarious work schedules at baseline. We present descriptive statistics for components of the instability scale in Table 1. Only 47.8% of respondents reported receiving their schedule more than two weeks in advance. Significant fractions of respondents were also exposed to on-call shifts (21.2%), cancelled shifts (13.6%), and clopening shifts (42.0%). Just less than 80% of respondents had their employer change the timing or length of their scheduled shift. Taken together, we see that 8.7% of respondents were exposed to 0 types of schedule instability, 56.6% to 1 to 2 types, and 34.7% to 3 to 5 types. In addition, 39.7% of respondents reported a variable work schedule and slightly less than 60% would prefer to work more hours.

We present descriptive statistics for the four hypothesized mediators in Table 2. The caregiving/work–family conflict scale ranges from –1.7 to 1.2 with a mean of 0.1 and meets conventional thresholds for internal consistency ($\alpha = 0.78$). In unreported analyses, we find that parents and non-parents take on similar values for the caregiving/work–family conflict scale and that the scale has nearly identical internal consistency for both groups, suggesting that the scale can reliably measure respondents' ability to meet a broad set of caregiving and family obligations. The financial strain scale is centered at 0, ranges between –2 and 0.7, and meets conventional thresholds for internal consistency ($\alpha = 0.76$). Slightly less than half of respondents report that their supervisor always treats them fairly, and more than a third of respondents are very satisfied with their job.

Table 3 describes the extent of turnover in our sample. We see that 30.3% had left their jobs by the time of our follow-up. Given a mean follow-up period of seven months, this implies a 51.9% annual turnover rate, which closely tracks the 53.0% documented in the sector in 2017 (Bureau of Labor Statistics 2018). We see that the very large majority of this turnover (89%) is reported by respondents to be quits rather than involuntary terminations. When asked to select all reasons why they quit, nearly half of respondents report that they quit in order to take a better job. But, large shares also list a bad work schedule (25.4%), bad manager (30.5%), or just bad job quality overall (16.5%) as reasons for quitting.

Work Schedule Instability and Job Turnover

Table 4 presents results from a set of logistic regression models in which job turnover is regressed on a measure of work schedule instability and covariates (coefficients on control variables are presented in Table A.3). We plot predicted probabilities from these regressions in Figure 1. Across the six measures of schedule instability and unpredictability, we see a consistent
| Demographic variables | Mean or % | Economic variables | Mean or % | Scheduling variables | Mean or % |
|-----------------------|-----------|---------------------|-----------|----------------------|-----------|
| **Race**              |           | **Job tenure**      |           | **Wants more hours** |           |
| White Non-Hispanic    | 74.6      | Less than 1 year    | 25.6      | Strongly agree       | 27.2      |
| Black Non-Hispanic    | 4.3       | 1–2 years           | 36.3      | Agree                | 32.2      |
| Hispanic              | 15.7      | 3–5 years           | 20.4      | Disagree             | 34.2      |
| Other Race/Ethnicity  | 5.4       | 6+ years            | 17.6      | Strongly disagree    | 6.4       |
| Non-Hispanic          |           |                     |           |                      |           |
| **Female**            | 69.5      |                     |           |                      |           |
| **Has kids**          | 27.7      |                     |           |                      |           |
| **Age group (years)** |           |                     |           |                      |           |
| 18–19                 | 18.0      |                     |           |                      |           |
| 20–29                 | 50.5      |                     |           |                      |           |
| 30–39                 | 16.8      |                     |           |                      |           |
| 40–49                 | 9.9       |                     |           |                      |           |
| 50–59                 | 3.9       |                     |           |                      |           |
| 60–69                 | 0.9       |                     |           |                      |           |
| **Education**         |           | **Weekly earnings ($)** | Baseline | 383.8 |                      |           |
| No degree or diploma earned | 4.4 | | | | | |
| High school diploma/GED | 24.9 | Follow-up (employed respondents only) | 413.5 | | | |
| Some college          | 70.7      | Follow-up (all respondents) | 377.5 | | | |
| Enrolled in school    | 37.4      |                     |           |                      |           |
| **Relationship status** |       |                     |           |                      |           |
| Married               | 19.2      |                     |           |                      |           |
| Cohabiting            | 23.7      |                     |           |                      |           |
| Single                | 57.2      |                     |           |                      |           |
| **Months between contact** |   |                     |           |                      |           |
| Min                   | 5.0       |                     |           |                      |           |
| Mean                  | 7.1       |                     |           |                      |           |
| Max                   | 9.0       |                     |           |                      |           |
| **n**                 | 1,827     |                     |           |                      |           |
pattern: Greater work schedule instability and unpredictability are associated with a higher probability of job turnover.

On-call work and cancelled shifts are each associated with greater probability of job turnover. Workers held on-call are 21% (6 percentage points) more likely to leave their employer than those who did not work on-call shifts. Shift cancellations were associated with a 38% (11 percentage points) higher turnover rate.

Exposure to last-minute scheduling adjustments also increases respondents’ likelihood of turnover. Respondents who had last-minute changes to the timing or length of their shifts were 19% (5 percentage points) more likely to turnover. Similarly, respondents who receive less advance notice of their work schedule are more likely to leave their job. Compared to respondents who
receive their schedules two or more weeks in advance, turnover is 23% (6 percentage points) higher for respondents with one to two weeks of advance notice and almost 35% (9 percentage points) greater for respondents with less than a week of advance notice.

We find the same pattern in the relationship between the composite instability scale and job turnover. Compared to respondents who report no instability, the turnover rate is 50% (12 percentage points) higher for respondents with exposure to three to five types of instability. The more types of schedule instability a worker faces, the more likely that worker is to leave the job.

### Four Potential Mediators of the Relationship between Schedule Instability and Turnover

Having documented consistent significant relationships between schedule instability and job turnover, we next examine four potential pathways through which exposure to more forms of schedule instability may lead to

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**Table 4.** Predicted Probabilities, Log Odds, and Odds Ratios of Turnover Regressed on Schedule Instability

| Model          | Predicted probability | Log Odds | Robust SE | Odds ratio | 95% CI   |
|----------------|-----------------------|----------|-----------|------------|----------|
| (1) On-call    |                       |          |           |            |          |
| No             | 0.29                  |          |           |            |          |
| Yes            | 0.35***               | 0.31**   | (0.13)    | 1.37**     | [1.06 – 1.76] |
| Cancelled shift|                       |          |           |            |          |
| No             | 0.29                  |          |           |            |          |
| Yes            | 0.40***               | 0.58***  | (0.15)    | 1.78***    | [1.31 – 2.41] |
| Clopening shift|                       |          |           |            |          |
| No             | 0.29                  |          |           |            |          |
| Yes            | 0.32                  | 0.16     | (0.11)    | 1.17       | [0.94 – 1.47] |
| Timing change  |                       |          |           |            |          |
| No             | 0.26                  |          |           |            |          |
| Yes            | 0.31**                | 0.28*    | (0.15)    | 1.33*      | [0.99 – 1.78] |
| Advance notice |                       |          |           |            |          |
| 2 weeks or more| 0.26                  |          |           |            |          |
| (reference category) |               |          |           |            |          |
| Between 1 and 2 weeks | 0.32***       | 0.32**   | (0.13)    | 1.37**     | [1.06 – 1.78] |
| One week or less | 0.35***       | 0.45***  | (0.14)    | 1.57***    | [1.19 – 2.07] |
| Instability scale|                      |          |           |            |          |
| 0 types of instability (reference category) | 0.24 |          |           |            |          |
| 1 to 2         | 0.27                  | 0.16     | (0.23)    | 1.17       | [0.74 – 1.85] |
| 3 to 5         | 0.36***               | 0.62**   | (0.25)    | 1.85**     | [1.14 – 3.00] |

*Notes:* Each model includes controls for race, gender, parenthood status, age, educational attainment, school enrollment, marital status, job tenure, managerial status, industry, weekly earnings, respondent preference for more work hours, schedule control, and time between interviews. CI, confidence interval; SE, standard error.

*p < 0.10; **p < 0.05; ***p < 0.01.
Figure 1. Predicted Probability of Turnover by Types of Schedule Instability

Notes: Predicted probabilities are plotted using the graphic scheme plottig (Bischof 2017).
job turnover. Table 5 reports the results from mediation analyses of the relationship between schedule instability and turnover, decomposing the total association between schedule instability and turnover into its components independent of any of the hypothesized mediators and its components that act through each of the mediators. Direct and indirect effects are presented both as coefficients and as percentages of the total effect. We use the language of “effect” below to be consistent with the terminology in the methods literature on mediation on which we draw (e.g., Baron and Kenny 1986; Breen et al. 2013), but we note that this is not a causal mediation analysis.

Respondents with exposure to 3 to 5 types of schedule instability are more likely to leave their jobs than respondents exposed to 0 types of schedule instability. Table 5 shows that almost 90% of this relationship acts through our four hypothesized mediators. The largest portion of this mediation occurs through job satisfaction—45% of the relationship between schedule instability and turnover is explained through the effect of schedule instability on job satisfaction and its subsequent effect on turnover. Work–family conflict accounts for just less than a quarter of the total indirect effect. The remainder of mediation is split evenly between financial strain and perceptions of fair treatment by respondents’ supervisors. In Table A.4 we conduct mediation analyses of each mediator one at a time and demonstrate that on their own, work–family conflict and job satisfaction significantly mediate the relationship between schedule instability and turnover for respondents with exposure to 3 to 5 forms of instability whereas financial strain and perceptions of supervisor fairness do not. Together, our hypothesized mediators explain nearly all of the relationship between schedule instability on turnover, with job satisfaction contributing most to the relationship followed by work–family conflict.

Table 5. Log Odds of Turnover Regressed on Schedule Instability Scale with and without All Mediators

| Instability scale | Total effect | Direct effect | Indirect effect | % of Δ in total effect |
|-------------------|-------------|--------------|----------------|------------------------|
| 1 to 2            | 0.137       | -0.127       | 0.264          | Work-family conflict: 25% |
|                   | (0.234)     | (0.236)      | (0.270)        | Job satisfaction: 44% |
|                   | 100%        | -95%         | 193%           | Financial strain: 13% |
|                   |             |              |                | Fair treatment: 18% |
| 3 to 5            | 0.608**     | 0.0650       | 0.543**        | Work-family conflict: 24% |
|                   | (0.246)     | (0.256)      | (0.276)        | Job satisfaction: 45% |
|                   | 100%        | 11%          | 89%            | Financial strain: 16% |
|                   |             |              |                | Fair treatment: 16% |

Notes: Log odds coefficients, robust standard errors (total and direct effects), and Sobel (1982) standard errors (indirect effects) and percentage mediated shown.

n = 1,827
Job Turnover and Earnings

First, we estimate the change in earnings attributable to job turnover for all respondents, including those who are jobless at follow-up and thus earn $0 (see Table 6). OLS and fixed-effects estimates show that net of controls, employees who experience either voluntary or involuntary job turnover after the baseline survey earned approximately $130 less per week than did respondents who remained in the same job. We see slightly smaller estimates of earnings losses attributable to turnover among respondents who quit their job, perhaps because of unobserved heterogeneity between those who are fired and those who quit. The general pattern remains the same, however. Overall, job turnover is associated with downward mobility in earnings in the short run.

Respondents on average experience substantial earnings losses in the months following turnover, yet we are also interested in whether those earnings losses persist after respondents become re-employed. For these analyses, we code jobless respondents as missing data on earnings. Results from OLS and fixed-effects models reported in Table 7 show no change in earnings on average for respondents who become re-employed after leaving their original job. Concerns that these results are driven by bias in selection into re-employment are understandable if respondents who become re-employed differ from those who remain jobless on some unobserved characteristic that affects earnings. We address issues of selection bias using the Heckman selection model. Regression coefficients from the selection equations can be found in Table A.5. Results from the Heckman model, as presented in Table 7, suggest that, after correcting for selection into re-employment, those who leave their job may experience modest earnings growth upon re-employment. Overall, our results suggest that, on average, turnover has little effect on earnings upon re-employment.

Table 6. Weekly Earnings Regressed on Turnover

| Model | Weekly Earnings (includes $0 earners) | OLS | FE |
|-------|--------------------------------------|-----|----|
|       |                                      | Δ   |     |
| (1)   | Left job                             | -126.7*** | -129.2*** |
|       |                                      | (15.37) | (15.53) |
|       | n                                    | 1,542 | 3,369 |
| (2)   | Quit job                             | -114.2*** | -118.0*** |
|       |                                      | (15.92) | (16.20) |
|       | n                                    | 1,504 | 3,331 |

Notes: Ordinary least squares (OLS) and fixed-effects (FE) coefficients and (robust standard errors) shown. OLS models control for race, gender, parenthood status, age, educational attainment, school enrollment, marital status, job tenure, managerial status, industry, respondent preference for more work hours, schedule control, weekly earnings at baseline, and time between interviews. Fixed-effect models control for person and time fixed effects.

*p < 0.10; **p < 0.05; ***p < 0.01.
Our model of cumulative disadvantage posits that exposure to unstable work schedules propagates into disadvantage in turnover, and in turn, that turnover may create additional disadvantage in earnings. We next ask if disadvantage due to schedule instability carries through turnover to disadvantage in earnings for workers leaving jobs with unstable schedules.

In Table 8 we report the adjusted difference in earnings between job-stayers and job-leavers by schedule instability measured at the first survey round. In OLS and fixed-effects analyses that include respondents who are jobless at follow-up as $0 earners, we show that turnover reduces weekly earnings for all respondents. Those who leave jobs in which they were exposed to 0 forms of schedule instability lose more than $300 per week on average, while those who leave jobs with 1 to 5 forms of schedule instability lose a little more than $100 per week on average.

Our analysis of changes in weekly earnings among those who become re-employed shows heterogeneous effects of turnover by baseline schedule instability (see Table 8). The OLS, Heckman, and fixed-effects models all show that respondents with exposure to 0 forms of schedule instability and respondents with 3 to 5 forms of schedule instability on average experience no change in earnings upon re-employment. Respondents leaving jobs with 1 or 2 forms of schedule instability, however, find re-employment in jobs in which they earn approximately $50 per week more on average. Turnover does not appear to lead to upward mobility for individuals in jobs with high levels of schedule instability, but for workers in jobs with moderate schedule instability, turnover may provide an opportunity to interrupt the accumulation of disadvantage from unstable work schedules.

### Table 7. Changes in Earnings Regressed on Turnover and Turnover Reasons (No $0 Earners)

| Model | OLS | Heckman | FE |
|-------|-----|---------|----|
| Left job | 19.65 | 28.81* | 15.86 |
| (14.97) | (14.74) | (16.39) | |
| n | 1,408 | 1,827 | 3,235 |
| Quit job | 15.70 | 25.46 | 11.50 |
| (15.95) | (15.74) | (17.66) | |
| n | 1,391 | 1,810 | 3,218 |

Notes: Ordinary least squares (OLS), Heckman Correction, and fixed-effects (FE) coefficients and (robust standard errors) shown. OLS and Heckman models control for race, gender, parenthood status, age, educational attainment, school enrollment, marital status, job tenure, managerial status, industry, respondent preference for more work hours, schedule control, weekly earnings at baseline, and time between interviews. Heckman models include dependency ratio in selection equation. Coefficients for selection equation reported in Table A.5. FE models control for person and time fixed effects. *p < 0.10; **p < 0.05; ***p < 0.01.
Many workers in service-sector jobs experience significant instability and unpredictability in their work schedules as well as substantial employment instability in the form of high rates of turnover and short job tenure. Whereas previous studies have described the forms and prevalence of precarious work and its consequences for household economic security and well-being, we seek to expand our conception of precarious work not just as a set of economic conditions along which inequality is organized but also as a cumulative disadvantage process that further entrenches economic inequality. We apply this approach to understand how exposure to work schedule instability affects turnover, the mechanisms underlying that relationship, and the downstream consequences of turnover on earnings for retail and food service workers.

Drawing on longitudinal data from the Shift Project, we find that workers in the retail and food service sectors who are exposed to more unstable and unpredictable work scheduling practices are significantly more likely to experience turnover. These results build on work by Lambert and Henly (2010, 2012) at the establishment level showing an association between managers’ scheduling strategies and establishment rates of turnover as well as

### Table 8. Marginal Effect of Turnover on Weekly Earnings by Schedule Instability at Baseline

| Model | Turnover | \( \Delta \) Weekly Earnings | \( \Delta \) Weekly Earnings |
|-------|----------|----------------------------|----------------------------|
|       |          | (includes $0 earners)      | (excludes $0 earners)      |
|       |          | OLS FE                     | OLS Heckman FE             |
| (1)   | Left job x Instability scale = 0 | -307.5*** | -324.7*** | -180.8 | -155.4 | -202.5 |
|       | Left job x instability scale = 1 to 2 | -112.0*** | -114.5*** | 47.07** | 54.42** | 42.40* |
|       | Left job x instability scale = 3 to 5 | -122.3*** | -124.4*** | 12.83 | 16.91 | 13.64 |
| Wald test |                      | * | * | * | * | * |
| n   |          | 1,542 | 3,569 | 1,408 | 1,827 | 3,235 |
| (2)   | Quit x Instability scale = 0 | -326.1*** | -355.0*** | -214.4* | -189.7 | -240.6 |
|       | Quit x instability scale = 1 | -93.58*** | -96.58*** | 40.10* | 47.66** | 33.30 |
|       | Quit x instability scale = 2 | -114.0*** | -116.5*** | 15.71 | 19.56 | 16.25 |
| Wald test |                      | * | * | * | * | * |
| n   |          | 1,504 | 3,331 | 1,391 | 1,766 | 3,218 |

*Notes: Ordinary least squares (OLS), fixed effects (FE), and Heckman estimates shown. In each model, turnover is interacted with instability measured at baseline. Values in each cell represent the change in earnings associated with turnover, among respondents at each level of schedule instability at baseline. OLS and Heckman models control for race, gender, parenthood status, age, educational attainment, school enrollment, marital status, job tenure, managerial status, industry, respondent preference for more work hours, schedule control, weekly earnings at baseline, and time between interviews. Heckman models include dependency ratio in selection equation. FE models control for person and time fixed effects. Wald test reports significance of interaction between turnover variable and instability scale measured at baseline.

\*p < 0.10; \**p < 0.05; \***p < 0.01.
as work at the worker level showing the association between hour volatility and turnover (Kesavan and Kuhnen 2017). Here, we connect a richer set of specific scheduling practices to turnover at the worker level. We find that workers exposed to on-call shifts, last-minute shift cancellations, timing changes, and limited advance notice are all significantly and substantially more likely to leave their jobs. Not only were individual types of schedule instability associated with turnover, but exposure to multiple forms of schedule instability also increased workers’ likelihood of turnover.

Our model of cumulative disadvantage posits that exposure to unstable and unpredictable work schedules can start a process in which the negative effects of schedule instability permeate through a set of interconnected domains of workers’ lives. We find robust evidence supporting this model. Our analyses represent, to our knowledge, the first empirical investigation of the mechanisms connecting schedule instability to both turnover and earnings. We show that almost all of the effect of schedule instability on turnover operates through its effect on work–life conflict and job satisfaction. Given the substantial variation in work scheduling practices between employers in the retail and food service sectors, workers may change employers to obtain more desirable work schedules that allow them to balance work and family life, even if doing so risks lost earnings during periods of joblessness.

Although economic models of turnover predict workers will quit for better wage offers and prior research suggests that schedule instability reduces earnings and increases earnings volatility, we find that financial instability only weakly mediates the relationship between schedule instability and turnover. These findings call attention to the importance of non-financial drivers of labor turnover among low-wage workers and suggest that future work should examine the extent to which low-wage workers secure better work schedules by changing employers.

One reason financial instability may only weakly mediate the relationship between schedule instability and turnover is that low-wage workers may have trouble finding a new job with better or more stable pay. Other work has shown that even though the rate at which workers change occupations over their career has increased over recent decades, workers in low-wage occupations are increasingly unlikely to experience upward mobility out of their occupational class (Kambourov and Manovskii 2008; Kim 2013; Jarvis and Song 2017). If workers in retail and food service jobs expect that they would not be able to find a job with better pay or lower earnings volatility, then financial strain from work schedule instability may not lead them to quit.

Results from our analyses of the earnings consequences of turnover offer some support for this idea. We show that workers who leave their jobs experience substantial earnings losses because of periods of joblessness, and upon re-employment workers see no increase in earnings on average. These findings are robust to the inclusion of individual fixed effects, though after
accounting for bias in selection into re-employment we see weak evidence of a modest increase in average earnings by less than $30 per week from re-employment after turnover. Given that on average turnover is not associated with increased earnings, it seems reasonable that schedule instability and turnover would be related primarily through non-financial rather than financial mechanisms.

Last, we consider the possibility that turnover could have heterogeneous effects on future earnings based on workers’ level of schedule instability at baseline. In models that account for 25% of job-leavers remaining jobless at follow-up, we find that workers leaving jobs with 0 forms of schedule instability experience the greatest earnings losses by far, whereas workers leaving jobs with exposure to any amount of schedule instability have smaller but still substantial earnings losses on average. The sizable earnings losses for respondents leaving jobs with no schedule instability are likely a result of their relatively high earnings in those jobs compared to respondents in jobs with higher levels of schedule instability. Across levels of schedule instability, turnover poses a significant threat to earnings because many workers experience prolonged periods of joblessness.

For workers at both extremes of schedule instability, turnover appears to be a process through which inequality becomes further entrenched. Respondents who leave jobs with 0 exposure to schedule instability tend to also be leaving jobs with relatively high pay, and on average are re-employed at relatively high-paying jobs. Similarly, respondents who are employed in jobs with relatively high schedule instability tend to have relatively low earnings, and job changes among these respondents do not change these respondents’ weekly earnings on average. However, turnover appears to provide an opportunity for upward mobility among workers leaving jobs with moderate levels of schedule instability. One potential explanation for this heterogeneity in the effect of turnover on earnings is that extreme schedule instability creates a low-earnings trap by creating such intense conflict in workers’ home and work lives that they find it untenable to remain at their current job and change jobs simply to alleviate this strain, whereas workers in jobs with moderate levels of schedule instability may be willing to tolerate their work schedules and remain in those jobs until they are able to find a higher-paying alternative.

**Conclusion**

In all, we find that disadvantage accumulates among workers with highly unstable and unpredictable work schedules along several dimensions of job quality. Unlike workers with moderate levels of schedule instability who may experience upward mobility from changing employers, the third of workers with the most unstable schedules churn between employers without experiencing upward mobility. These precarious workers’ position on the margins of the economy becomes more entrenched as schedule instability
begets family and economic instability, which then begets employment instability. Rather than escaping the cycle of instability, these workers accumulate instability across dimensions of their economic and non-economic lives while providing employers with a set of workers whose schedule variation and high turnover allow employers a buffer against the ebb and flow of labor demand.

In addition to revealing important pathways through which schedule instability affects turnover and earnings, our model underscores the importance of attending to the indirect pathways through which disadvantage accumulates. Whereas much of the cumulative disadvantage literature studies how growth rates on a particular variable differ by one’s initial endowment of that variable or by one’s status-group membership (DiPrete and Eirich 2006), we advance a more processual approach to cumulative disadvantage that traces the pathways through which exposure to disadvantage at work can set workers on divergent labor market trajectories. While our analysis cannot fully capture how labor market disadvantage accumulates throughout workers’ entire life or career history (e.g., Sampson and Laub 1997, 2003; Singer et al. 1998), we highlight how precarious working conditions can instigate processes whereby disadvantage is accumulated over shorter time horizons within the career.

This analysis is not without limitations. We did not have sufficient longitudinal data to allow for panel data analysis with individual fixed effects in the models of work scheduling and turnover. Thus, we could not account for individuals’ unobserved characteristics in these analyses. It is possible that an unobserved trait leads some workers to select or be channeled into unstable and unpredictable schedules and to be more likely to leave their jobs. Therefore, we cannot rule out the possibility that some omitted variable in part explains the relationship between unstable work schedules and job turnover. Second, our data cover a relatively short period of time. A longer follow-up period is necessary to examine the longer-term mobility consequences of schedule-related turnover for workers themselves as well as for their children. Third, while we do not find evidence of differential panel attrition that we would expect to bias our estimates, we note that the baseline data are drawn from a non-probability sample of workers. Prior work suggests these data are valid (Schneider and Harknett 2019b), though we caution that they are not from a representative sample and are by design limited to workers at large retail and food service firms.

Through our examination of the mechanisms relating work schedules and turnover, we offer both empirical and theoretical contributions to the literature on precarious work. Empirically, we show that employees assigned unstable and unpredictable schedules are likely to experience higher turnover. The short-run efficiency gains made by employers through just-in-time scheduling practices come at the detriment of job stability and earnings for employees. Unstable and unpredictable schedules also have negative effects on employees’ economic and non-economic life by reducing job satisfaction,
interfering with caregiving obligations, deteriorating relationships with supervisors, and increasing financial instability. To the extent that firms incur search and training costs from turnover, our results suggest that firms may reduce turnover not only by decreasing their reliance on just-in-time scheduling practices but also by supporting workers’ ability to balance work and family obligations and improving employees’ overall job satisfaction. Finally, our work suggests that the various dimensions of job quality are not independent. We show that the negative outcomes workers experience from unstable and unpredictable schedules in turn affect turnover, and that turnover leads to lost earnings in the short run and re-employment in similar-paying jobs in the long run, suggesting that instability cumulates across dimensions of precarious work. In addition to policy efforts such as fair workweek legislation that would reduce exposure to schedule instability, our results suggest that policymakers may be able to interrupt the accumulation of disadvantage that is attributable to exposure to schedule instability by reducing the cost and duration of unemployment through unemployment benefits, public employment programs, or improved access to job-matching services.

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