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UNPREDICTABLE WORK TIMING IN RETAIL JOBS: IMPLICATIONS FOR EMPLOYEE WORK–LIFE CONFLICT

JULIA R. HENLY AND SUSAN J. LAMBERT*

Unpredictability is a distinctive dimension of working time that has been examined primarily in the context of unplanned overtime and in male-dominated occupations. The authors assess the extent to which female employees in low-skilled retail jobs whose work schedules are unpredictable report greater work–life conflict than do their counterparts with more predictable work schedules and whether employee input into work schedules reduces work–life conflict. Data include measures from employee surveys and firm records for a sample of hourly female workers employed across 21 stores of a U.S. women’s apparel retailer. Results demonstrate that, independent of other dimensions of nonstandard work hours, unpredictability is positively associated with three outcomes: general work–life conflict, time-based conflict, and strain-based conflict as measured by perceived employee stress. Employee input into work schedules is negatively related to these outcomes. Little evidence was found that schedule input moderates the association between unpredictable working time and work–life conflict.

Mounting concern over the growing precariousness of employment is fueling global interest in the changing nature of work, characterized in part by a relentless retreat from the standard nine-to-five workweek and a corresponding proliferation of alternative, nonstandard work arrangements (Kalleberg 2011; International Labour Organization [ILO] 2012). The rise in nonstandard employment arrangements includes the growth of part-time, casual, and temporary job statuses; nonstandard work hours that require early morning, evening, overnight, or weekend hours; and as we argue here, scheduling practices that result in unpredictable working time.

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KEYWORDS: working time, nonstandard schedules, low-wage work, work–life conflict, time-based conflict, strain-based conflict

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Although nonstandard employment practices are becoming commonplace in many Western industrialized countries, their ramifications for workers may be particularly severe in the United States, where both employment protections and the welfare state are relatively weak (Tilly and Carré 2011; Lambert, Haley-Lock, and Henly 2012).

Considerable work–life research has accumulated on the effects of working nonstandard hours, or what researchers outside the United States commonly refer to as unsocial hours, on a range of individual and family outcomes (cf. Heymann 2000; Fagan 2001; Presser 2003; Pocock and Clarke 2005). Another source of nonstandard work arrangements, unpredictable working time, is distinct from nonstandard working time in its focus on the uncertainty of working time rather than the hours of work per se. To date, unpredictable working time has been studied primarily in male-dominated sectors, such as manufacturing, and in occupations, such as professionals and managers, where concerns center on the potential deleterious consequences of long hours for workers, families, and the economy (Hinrichs, Roche, and Wiesenthal 1985; Bosch and Lehndorff 2001; Golden and Wiens-Tuers 2005; McCann 2007; Perlow 2012). Although elements of uncertainty are sometimes embedded in indices of nonstandard work hours and discussed together with other forms of precarious employment, few studies consider the unique contributions of unpredictable working time to work–life conflict, and those that do either use qualitative methodologies (cf. Zeytinoglu, Lillevik, Seaton, and Moruz 2004) or draw conclusions on the basis of associations possibly inflated by common-method variance (cf. Doty and Glick 1998; Eurofound 2012; ILO 2012).

In this article, we focus on three sources of unpredictable working time (limited advance schedule notice, last-minute changes to posted work schedules, and variations in days worked week to week) in regular work hours, that is, the 40 or fewer hours for which U.S. employers are not required to pay an overtime premium. We examine unpredictable working time in the context of a female-dominated occupation (retail store sales associate) in which hours are often scarce (i.e., part-time work is common, and overtime is rare) and work during unsocial times (weekends and evenings) is required (cf. Lambert et al. 2012). Our sample is composed of women working in hourly sales associate jobs in 21 stores of a national women's apparel retailer in the United States. Measures of unpredictable working time are developed from firm payroll records and actual posted schedules, as well as employee survey data, thereby reducing the possibility that common-method variance can fully explain the observed associations between unpredictable working time and both time- and strain-based work–life conflicts measured via an employee survey (Reio 2010).

Our goal is to contribute to knowledge on the ramifications of working time for workers' personal and family lives by addressing the question of whether unpredictable working time contributes to work–life conflict independent of two other aspects of nonstandard employment, specifically nonstandard work hours and scarce hours. We hypothesize that unpredictable

working time produces time-based and strain-based conflicts that create stress and challenge retail sales associates' ability to effectively plan activities and meet responsibilities outside of work, such as participating in children's school and extra-curricular programs, assisting with caregiving needs of aging parents, scheduling medical appointments, and socializing with friends. Prior research suggests that workers with limited input into their work schedule are likely to find schedule unpredictability especially challenging, and thus, we also assess the hypothesis that schedule input reduces work-life conflict and that unpredictable working time interacts with schedule input in explaining variation in work-life conflict.

In sum, our goal is to advance knowledge about the ramifications of work schedules for workers' personal and family lives by examining the unique contribution that unpredictable working time may make to time- and strain-based work-life conflicts. In doing so, we extend the study of unpredictable working time beyond overtime hours to regular work hours, from male-dominated occupations to a female-dominated occupation, and from uncertainty in the context of long work hours to uncertainty in the context of scarce hours.

Literature Review and Conceptual Framework

In his 2009 presidential address to the American Sociological Association, Arne Kalleberg spoke of the growing precariousness of work and increasing economic insecurity of workers. By *precariousness*, Kalleberg referred to "employment that is uncertain, unpredictable, and risky from the point of view of the worker"; he stated:

Creating insecurity for many people, [precarious work] has pervasive consequences not only for the nature of work, workplaces, and people's work experiences, but also for many nonwork individual (e.g., stress, education), social (e.g., family, community), and political (e.g., stability, democratization) outcomes. It is thus important that we understand the new workplace arrangements that generate precarious work and insecurity. (2009: 2)

Precarious employment is not restricted to a few firms or to the United States, but instead, reflects growing national and international trends in employment relations across industries that have profound implications for individual and family economic security (Hinrichs et al. 1985; Burchell 2002; Appelbaum, Bernhardt, and Murnane 2003; Kalleberg 2009, 2011; Gautié and Schmitt 2010; Carré, Tilly, Van Klaveren, and Voss-Dahm 2010; Haley-Lock 2011; ILO 2012). Workers with limited education and skills, with inadequate financial resources, who are minorities, and who are single parents (Presser and Cox 1997; Presser 2003; Kalleberg 2011) are at particular risk of experiencing precarious work conditions. These workers are disproportionately paid by the hour and are employed in part-time, contingent, or temporary jobs in the United States (see Tilly 1996; Herzenberg, Alic, and Wial 1998; Kalleberg 2011; Osterman and Shulman 2011) and in casual or variable-hour contract jobs in the United Kingdom and other Western

European countries (Rubery, Ward, Grimshaw, and Beynon 2005; McCann 2007; ILO 2012). Nonstandard work hours are common with precarious work (Presser 2003; Golden 2005; Osterman and Shulman 2011; ILO 2012).

Jobs in the retail sector, such as sales associate, epitomize nonstandard schedule hourly jobs and typically require employees to work at least some hours during evenings and weekends (Zeytinoglu et al. 2004; Jany-Catrice and Lehndorff 2005; Henly, Shaefer, and Waxman 2006; Grugulis and Bozkurt 2011). Retail is a growth sector that employs a significant segment of the U.S. workforce (10.8% of men and 11.3% of women; U.S. of Labor Statistics 2012). The majority of sales associates are women both in the United States (U.S. Bureau of Labor Statistics 2012) and Europe (Jany-Catrice and Lehndorff 2005).

Unpredictable Working Time as Precarious Employment

In addition to precarious job status and nonstandard work hours, we argue that unpredictable working time is another important dimension of precarious employment. Our focus is on three employer practices that produce unpredictability in regular work hours: limited advance schedule notice, schedule changes, and variability in the days of work. Limited advance notice of when workers are expected to work may be a source of unpredictability because it complicates workers' ability to anticipate which days they will be working and when they will be available to fulfill nonwork responsibilities, such as caregiving or personal health care. Changes to workers' scheduled days, whether through modifications to a posted schedule or through adjustments made at the last minute, may be a source of unpredictability because unanticipated schedule adjustments may create time conflicts with previously arranged activities and further obfuscate workers' assessments of when they will be available to attend to nonwork obligations. Finally, workers whose workdays vary from week to week may be uncertain about their specific schedule in any future week, thereby challenging their ability to schedule appointments or plan other nonwork commitments. In contrast, employees with stable schedules can readily anticipate both which days they are likely to work and which days they will have off, independent of how far in advance they receive their particular schedule.

Unpredictable scheduling practices represent efforts by employers to control labor costs by closely matching employees' work hours to variations in consumer demand, in effect shifting risk from firms to workers (Jacobs 1994; Appelbaum, Bailey, Berg, and Kalleberg 2000; Appelbaum et al. 2003; Jany-Catrice and Lehndorff 2005; Smith 2005; Lambert 2008; Carré et al. 2010; Kalleberg 2011). As flexible labor practices have expanded around the globe, research suggests, so has unpredictable working time. In Canada, for example, national data show that, among workers who are not full-time workers with traditional daytime/weekday schedules, approximately one-third learned of their work schedule with one week or less notice (McCrate, Lambert, and Henly 2012). Similarly, in a 2010 survey of over 44,000

workers in 34 European nations, about a third of workers (37% of men and 33% of women) reported changes in their weekly work schedules, with 20% of men and 15% of women finding out about the changes that day or the day prior (Eurofound 2012). The business strategies that structure unpredictability into regular work hours may be particularly prevalent in the retail industry, where flexible labor practices are undermining job quality in multiple ways (Zeytinoglu et al. 2004; Carré, Tilly, and Holgate 2007; Carré et al. 2010; Grugulis and Bozkurt 2011).

How Schedule Unpredictability May Create Work–Life Conflict

Extending Greenhaus and Beutell's (1985) model of work-to-family conflict, we argue that unpredictable working time may be an important source of both time-based and strain-based work–life conflicts. Greenhaus and Beutell originally conceptualized work-to-family conflict as “a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect” (1985: 77). The sources of work-to-family conflict can be *time-based*, in which the time pressures of one role make it challenging to fulfill the demands of another role, or *strain-based*, in which the strain symptoms produced by one role interfere with one's ability to carry out another role. Such conflict is conceptualized in the literature as bidirectional (e.g., Greenhaus and Beutell 1985; Frone, Yardley, and Markel 1997; Kelloway, Gottlieb, and Barham 1999); however, because we are specifically interested in examining the implications of unpredictable working time, our focus in this study is unidirectional, from work to nonwork domains. Moreover, we expand the focus from the family to a broader set of work–life experiences.

Time-Based Sources of Work–Life Conflict

Studies employing both nationally representative and more targeted samples provide convincing evidence that working at nonstandard times can create time-based work–life conflict (Pleck, Staines, and Lang 1980; Major, Klein, and Ehrhart 2002; Presser 2003; Almeida and McDonald 2005; Fenwick and Tausig 2005). Few quantitative studies, however, examine the relationship between the unpredictability of work hours and time-based conflict. In the U.S. context, Golden and Weins-Tuers (2005) demonstrated that compulsory overtime (i.e., requiring work beyond normal hours) is related to difficulties meeting family demands. The study of working conditions in the 34 European nations (Eurofound 2012) found a positive association between limited advance notice of schedule changes and problems with work–life balance. Specifically, whereas only 14% of workers in the sample who reported no schedule changes reported problems with work–life balance, 35% of those who indicated that they found out about changes the same day, 30% of those who found out the day before, 25% of those who found out several days in advance, and 21% of those who found out several weeks in advance

reported having such problems. Several qualitative studies give further reasons to expect that unpredictable working time creates time-based conflict (Bohle, Quinlan, Kennedy, and Williamson 2004; Roy, Tubbs, and Burton 2004; Zeytinoglu et al. 2004; Henly and Lambert 2005; Lein, Benjamin, McManus, and Roy 2005; Scott, London, and Hurst 2005). For example, Zeytinoglu and colleagues (2004) reported that the limited advance schedule notice and variable working times experienced by the Canadian workers in their study interfered with workers' ability to manage personal responsibilities. Similarly, Bohle and colleagues (2004) found in their interview study of casual and full-time workers in two 5-star hotels that casual workers had much more unpredictability and variability in their work hours and that their schedules disrupted family and social activities and challenged their work-life balance. Further, Henly and Lambert (2005) reported that employed mothers in their Chicago-based retail sample who received work schedules with limited advance notice and who experienced frequent last-minute changes to their schedules had difficulty arranging childcare, volunteering for school outings, and planning family meals and activities.

In our current study, we explore the relationship between unpredictable working time and time-based work-life conflict as captured by the extent to which workers report not having enough time to fulfill their nonwork responsibilities. Informed by theories of social time (e.g., Presser 2003; Almeida and McDonald 2005), we argue that scheduling practices that create ambiguities in the timing of work make it difficult for employees to arrange and participate in activities central to other life spheres. For example, unpredictable working time is hypothesized to make planning such nonwork activities as doctor's appointments, social outings, and family activities difficult because workers may have inadequate time or be reluctant to schedule appointments or time with family and friends when they do not know whether they will be able to keep these commitments.

Strain-Based Sources of Work-Life Conflict

Greenhaus and Beutell (1985) pointed out that some work stressors that induce strain are independent of time-based work demands (e.g., role ambiguity, role conflict, and boundary-spanning activities), whereas other work stressors (e.g., extensive time involvement) can produce both time-based and strain-based conflicts.¹ We extend Greenhaus and Beutell's argument to unpredictable working times, which we expect to contribute to both

¹A stress model underlies much of the literature concerned with work-life conflict (see Eckenrode and Gore 1990; Edwards and Rothbard 2005). Over the past quarter century, a substantial list has accumulated of work stressors with demonstrated relationships to many strain symptoms and stress-related outcomes. For example, different measures of work demands, including excessive hours and nonstandard timing, have been associated with role strain (Staines and Pleck 1983), depression (Googins 1991; Frone, Russell, and Cooper 1997), fatigue (Pleck et al. 1980; Googins 1991), irritability (Pleck et al. 1980), somatic complaints (Burke 1988), lack of general well-being (Grant-Vallone and Donaldson 2001), heavy alcohol use (Frone et al. 1997), psychological distress (Matthews, Conger, and Wickrama 1996), and problematic marital relationships (Matthews et al. 1996).

time-based conflict and strain-based conflict, such as perceived stress. Zeytinoglu and colleagues (2004) provided some preliminary support for the argument that unpredictability in regular work hours created both time-based and strain-based work–life conflicts. Scheduling practices that give workers limited advance schedule notice and that require work at variable times and on variable days were identified as significant sources of stress by retail employees in the study, and the stress was perceived to have negative consequences for workplace performance and staff morale. Moreover, Zeytinoglu and colleagues reported that these practices, together with the uncertainty created by not knowing how many hours one would work each week, led to job strain and employee stress. Similarly, for working parents, setting up “just in case” childcare to respond to uncertain work hours or scrambling to arrange childcare at the last minute to accommodate unplanned schedule changes may not only create time conflicts but also take an emotional toll and increase stress, especially among parents with limited resources (Chaudry 2004; Henly and Lambert 2005; Scott et al. 2005).

We thus reason that unpredictability in regular work hours will be associated with both time-based and strain-based work–life conflicts. Similar to the synergy created by bundles of different human resource (HR) practices in shaping worker experiences and outcomes (MacDuffie 1995; Batt 2002), we also explore whether exposure to unpredictability from multiple sources—in this case, limited advance schedule notice, schedule changes, and varying work days—increases the degree of time- and strain-based work–life conflicts reported by employees.

Employee Schedule Input

Despite the fact that unpredictable working time is commonplace in retail workplaces, frontline managers who are responsible for setting and changing schedules may vary in the degree to which they take employees’ schedule requests into account. For example, our prior research on store managers’ staffing practices indicated that “how managers assign [staffing] hours suggests that cost containment pressures curtail, but do not derail, managers’ ability to respond positively to employees’ scheduling needs. Most managers report using the agency they have to schedule in ways that support both business goals and employee preferences, while privileging the former over the latter” (Lambert and Henly 2012: 151). In the current study, we consider the possibility that employees’ having input into their schedules can reduce work–life conflict regardless of the extent of unpredictability in work hours and that the consequences of unpredictable working time may be most severe among retail workers in our sample who have limited schedule input.

The decision-making process through which managers take sales associates’ work-hour preferences into account is one that straddles the top-down and consultative forms of decision making rather than one that delegates decision-making authority to employees (Lawler 1986). Sales associates may have input into their work schedules but have little control over them, which

would be consistent with findings from national samples of U.S. and European workers that indicated that workers in low-skilled jobs have less control over their work hours than their counterparts in higher-skilled jobs (Galinsky, Hughes, and David 1990; Golden 2005; European Foundation for the Improvement of Living and Working Conditions 2007; McCrate 2012).

Although national surveys revealed that the kind of formal flexibility arrangements that have been shown to benefit professional and managerial workers (Kossek, Lautsch, and Eaton 2005; Hill et al. 2008; Joyce, Pabayo, Critchley, and Bambra 2010) are rare in low-skilled jobs, smaller, more focused studies of specific job sectors demonstrated that employees in low-skilled jobs sometimes gain input into their work schedules through informal negotiations with supervisors and benefit from having input when available (Henly et al. 2006; Swanberg, McKechnie, Ojha, and James 2011). For these workers, the negative implications of unpredictable working time may be somewhat offset by this negotiated input. For workers who do not benefit from such informal arrangements, however, unpredictable working time may be particularly stressful and challenging, driven solely by employer needs. Because few data sets include comprehensive measures of the various dimensions of working time as well as schedule input, the extent to which schedule input may mitigate the potential negative effects of schedule unpredictability on work–life outcomes is difficult to estimate. For example, the lack of measures of advance notice in the U.S. Current Population Survey makes it difficult to trace work–life challenges in long-hour jobs to the inability to refuse overtime or the lack of advance notice of mandatory overtime.

Controls: Nonstandard Hours and Personal Characteristics

A central goal of this study is to explore the extent to which unpredictable working time contributes to work–life conflict beyond nonstandard (unsocial) work hours. Even though all workers in the retail firm studied are at high risk of working during nonstandard hours, especially evenings and weekends, the degree varies. To estimate the contribution that unpredictable working time per se may make to work–life conflict beyond nonstandard work hours, we control for the proportion of actual work hours (from firm payroll records) that take place outside of daytime, weekday hours. We also control for the average number of hours employees work from week to week (from firm payroll records) and their job title (sales associate or assistant manager) to assess the extent to which unpredictable working time matters to work–life conflict independent of how many, or how few, hours employees work and whether they perform management functions.

The analyses also incorporate several demographic variables (education, age, and caregiving responsibilities) based on prior research demonstrating their association with job conditions as well as work–life conflict and stress (Frone, Yardley, et al. 1997; Moen and Yu 1999; Grzywacz, Almeida, and McDonald 2002; Presser 2003; McLoyd, Toyokawa, and Kaplan 2008). In addition, we control for whether the employee has a second job, which may

be related to variations in the days of work in the target job and other sources of unpredictable working time, as well as to work–life conflict. Finally, we control for the presence of a partner because the availability of a partner to share living expenses and caregiving may further influence workers' ability to tolerate unpredictable working time and may have independent associations with time-based and strain-based conflicts.

Study Hypotheses

Hypothesis 1: The more unpredictable employees' working time is, the greater their work–life conflict.

Hypothesis 1a: The more sources of unpredictable working time employees face, the higher their level of work–life conflict.

Hypothesis 2: The more input employees have into their work schedule, the lower their work–life conflict.

Hypothesis 3: The relationship between unpredictability and work–life conflict is weakest when workers have more input into their schedules.

Method

The Retail Case Study and Context

The analyses presented in this article were conducted as part of a multicomponent case study that was designed to improve understanding of scheduling practices in the retail industry (Lambert and Henly 2010, 2012). The site for the study is a single employer—a large, national women's apparel retailer with individual stores located primarily in suburban strip malls. The case study included longitudinal analyses of turnover and retention from corporate management information systems; payroll data on when employees begin and end work each day; manager survey data on staffing and scheduling practices; and employee survey data on a range of job, personal, and family circumstances, experiences, and attitudes. In addition, researchers conducted multiple in-person interviews with managers at all levels of the company and observed store practices with the goal of designing a workplace intervention to improve schedule predictability in retail firms.

The sample for this study includes hourly employees in 21 stores in the Midwest, selected for inclusion because of their proximity to a common urban center. Stores in this firm are small, with an average staff of 10 that includes a store manager, one or two assistant managers or full-time sales associates, an occasional part-time stock person, and several part-time sales associates. As is common in retail firms in the United States, employee turnover in this firm is high, in 2008 over 100% among part-time hourly workers in the 21 sampled stores. All employees are paid by the hour, except the store manager, and all employees, including the store manager, share the tasks of putting out merchandise, helping customers, and ringing up sales. Managers of nine of these stores (randomly selected from the larger pool) agreed to try posting schedules further in advance than was their usual practice for a six-month period.

Although most of the managers in these nine pilot stores were successful at posting schedules further in advance than usual at least some of the time, it proved difficult for managers to do so reliably for the six-month pilot period.

The general staffing and scheduling practices found at the retail firm under study are similar to those at other retailers and in other industries (Lambert 2008; Carré et al. 2010); focusing on a single firm allows us to identify and measure the specific sources of unpredictable working time that confront hourly workers in this firm. Our methods take advantage of the fact that store managers in this firm have discretion in hiring and scheduling individual employees and, thus, that employees in the firm, and even in the same store, vary in the extent to which they know their schedule in advance, their schedule varies from week to week, and they experience last-minute adjustments to their work schedule.

Store managers in this firm face substantial pressures to contain outlays for labor. For example, each month the company provides store managers with an allotment of hours broken out by week. The ration of hours assigned to each store is derived using a formula that factors in the previous year's sales and current retail trends. Store managers are responsible for creating staff schedules based on these hours; however, district managers monitor store sales throughout the workday and routinely direct managers to decrease, and sometimes increase, hours for a particular day or week. Thus, store managers experience significant pressure to match staffing hours to ongoing sales, creating variability and unpredictability in the working time of the sales associates and assistant managers. In interviews and surveys, managers explained that managing within the sales-to-staff ratios complicates their ability to achieve other business objectives, such as providing good customer service and meeting company rules regarding minimum staffing. Managers reported engaging in several practices to keep labor costs down, including maintaining a relatively large pool of part-time staff that can be tapped to respond to variable scheduling needs and that entails few fixed costs given the absence of paid time off, health insurance, and other benefits for part-time staff at this company (see Lambert and Henly 2012).

These staffing strategies are coupled with scheduling practices that often result in limited advance notice of work hours to store employees. The majority of managers post schedules with one week or less lead time. Unpredictability also results from last-minute adjustments to the posted schedules, which occur frequently in this firm in response to sales fluctuations, employee turnover and call-offs, and higher-level management pressures to reduce labor costs. How managers make schedule adjustments affects the extent to which individual employees experience unpredictability in their working time, producing variation across as well as within the stores.

Sources of Data

The data for the analyses come from both firm records (weekly posted schedules, employee payroll records, and personnel information system)

and employee surveys. The study period during which these data were gathered was from May through December 2008.

Firm Records

Weekly posted schedules are the schedules that managers posted for employees to view before any modifications were made. Employee payroll records are based on electronic records of when each employee clocked in and out of work each day of the study period. The personnel information system provides demographic information on all employees, including birthdate, hire date, and occupation (sales associate or assistant manager).

Employee Survey Data

A telephone survey, lasting 30 to 45 minutes, was conducted with employees in all 21 stores in winter 2008. The sample was drawn from firm records in October 2008, and all employees working in the target stores at that time, both hourly and salaried, were eligible for participation in the survey ($n = 256$). Contact information was obtained by providing store managers with letters to distribute to all store employees inviting them to opt-in to the study by returning their contact information, for which they received a \$10 gift card. Of the 190 employees (74.2% of 256) for whom valid contact information was obtained, 156 voluntarily participated in the survey (60.9% of 256 eligible; 82.1% of 190 providing contact information). For the current analyses, we restricted the sample to the 112 hourly employees who were still working at the retail establishment at the time the survey was conducted (November to December 2008) and for whom we had at least four weeks of payroll data. We did not include salaried employees (i.e., store managers) because they are responsible for scheduling practices in the stores.

An analysis of the survey response rate bias revealed no significant differences between store employees who provided contact information and those who did not; however, of those who completed the survey, respondents were significantly older ($p < 0.03$) and more likely to be white ($p < 0.04$). All survey respondents received \$50 for participating in the employee survey.

Measures

Independent Variables

We include four measures of unpredictable working time (Limited advance notice, Last-minute changes, Day mismatch, and Day instability) and one measure of employee input into work schedules (Schedule input).

Limited advance notice is a survey item asking respondents: "Usually, how many days in advance do you know your schedule?" We collapsed responses into a dichotomous variable, with 1 indicating one week or less and 0 more than one week. We dichotomized advance notice, rather than treating it continuously, because of the nonlinear nature of responses. In particular,

most responses were spontaneously given as “one week” or “two weeks,” which the interviewer then converted to days. Twelve respondents reported receiving three or fewer days notice, and nine respondents reported receiving more than two weeks notice.

Last-minute changes is one of two measures of changes to the posted schedule. It is indicated by an employee survey item in which respondents reported on a four-point scale (where 1 is “strongly agree” and 4 is “strongly disagree”) the extent to which they agreed that “Last-minute adjustments are often made to my schedule.” We reversed the score responses such that higher values indicate more schedule changes.

Day mismatch is the second measure of changes to the posted schedule. This is the average number of days per week respondents did not work on a day they were originally scheduled to work. The measure is created by comparing the days an employee was scheduled to work (as indicated on the original posted weekly schedule) to the actual days worked (as indicated by employee payroll records) and averaging the misfit across the available weeks of scheduling data. The higher the value, the more unpredictable the working time. Preferably, Day mismatch should capture employer-initiated changes that are independent of employee actions, such as when a manager changes an employee’s workdays after posting them. Our data do not allow us to differentiate, however, between discrepancies that were employee-initiated and those that were employer-initiated; thus, Day mismatch necessarily incorporates both. Even with additional information, the root causes of schedule changes can be complex. Whereas some employee-initiated changes would have occurred even with a predictable schedule, many probably indicate that the posted schedule fell short of informing employees of their days of work with sufficient notice, leading employees to request changes to the schedule. Thus, the more discrepancies, for whatever reason, the less predictability provided by the posted schedule.

Day instability is a measure that captures the extent of instability in the particular days worked over the course of the period for which we have payroll data. This variable was created by calculating the probability that a respondent would work (or not work) for each day of the week (Sunday, Monday, Tuesday, etc.) based on payroll records for the study period. If a respondent always worked (or never worked) on Mondays, for example, the value for Mondays would be 1.0. If she worked on half of the Tuesdays, the value for Tuesdays would be 0.5. Day instability averages these values across the seven days of the week and reverses the probabilities so that 0 indicates complete stability and 1 indicates complete instability in the days worked from week to week. Thus, for both Day mismatch and Day instability, higher values indicate more unpredictability.

An additive Unpredictability variable indicates how many of the different sources of unpredictability a respondent experienced (0 to 4). To construct this variable, Last-minute changes, Day mismatch, and Day instability were dichotomized at their mean (0 indicating below-average unpredictability, and 1 indicating mean or greater unpredictability), and a count variable was

created that sums across these three variables plus the dichotomous Limited advance notice variable.

Schedule input is an index of four items from the employee survey ($\alpha = 0.77$). Two items asked about the amount of input respondents have into “the days you have off each week” and “the days you work each week.” The response categories are “a lot of input,” “some input,” “a little input,” and “no input at all.” The items were reversed-scored such that higher numbers indicate more input. The other two items addressed schedule input by assessing respondents’ agreement on a four-point scale with the following two statements: “Most weeks you can count on working the days and shifts you want,” and “Your store manager takes your preferences for work hours into account.” Because the four survey items did not employ the same response scale, the items were standardized and then averaged to create the Schedule input measure. Higher scores indicate more input into the work schedule.

Dependent Variables

We include three measures of work–life conflict, all derived from the employee survey: General work–life conflict, Time-based conflict, and Strain-based conflict. Higher scores on the three measures indicate greater conflict.

General work–life conflict is the average score on a five-item index adapted from Netemeyer, Boles, and McMurrian (1996) that combines both time- and strain-based items ($\alpha = 0.87$). Workers rated on a five-point scale how often the demands of their work interfered with personal or family time, created strain that made it difficult to fulfill personal or family responsibilities, and caused them to adjust their personal plans.

Time-based work–life conflict is captured using survey items that asked employees to report the extent to which they had adequate time for non-work activities. It is the average of four questions asking workers whether they had “more than enough time, just enough time, or not enough time” to schedule doctor’s appointments, plan activities with friends, plan a family outing, and arrange to cook a meal at home. Higher scores indicate more time-based conflict.

Strain-based work–life conflict is measured via an 8-item scale of perceived stress, adopted from Cohen, Kamarck, and Mermelstein’s (1983) original 14-item scale. The items asked workers to report on a five-point scale how often in the prior month they experienced, for example, feelings of anxiety, personal control, and confidence in their coping skills ($\alpha = 0.82$).

Control Variables

We include two measures of work hours in addition to the four measures of unpredictable working time that are our key independent variables. As an indicator of Nonstandard work hours, we calculated from the payroll data the proportion of all weekly work hours that fall outside Monday through Friday daytime hours (8 a.m. to 4 p.m.). A similar definition was used by

Presser (2003), although she based the proportion on self-reported hours worked in the prior week. Most of the stores in this study are open Monday through Saturday from 10 a.m. until 9 p.m. and on Sunday from 11 a.m. until 6 p.m. Thus, nonstandard hours in this firm take the form of work during the evening and on weekends, and do not include early morning or overnight work. Higher values indicate a greater proportion of Nonstandard work hours. We also controlled for the average number of Weekly hours worked, calculated from the payroll data for the study period.

We controlled for several demographic variables. Personnel records provided information to construct Age, a continuous variable calculated from the workers' birthdates. From the survey data, we calculated High school education, which differentiates workers who reported having no more than a high school degree (coded 1) from workers who reported additional education (coded 0); Caregiving responsibilities, a dichotomous measure that distinguishes workers with (coded 1) and without (coded 0) caregiving responsibilities for a child under 18 living in their home and/or the routine care of another child or an elderly or disabled adult; and Does not have a partner (coded 1), a dichotomous measure with married or cohabitating being the alternative category (coded 0). In addition, we included Second job, which differentiates employees who reported holding (coded 1) or not holding (coded 0) a job in addition to the target job, and Assistant manager, a dichotomous variable that differentiates hourly assistant managers (coded 1) from hourly sales associates (coded 0).²

Because nine stores participated in our pilot intervention that involved efforts to post schedules with greater advance notice, we controlled for whether the respondent was employed in a pilot store in all multivariate analyses. We also included a measure that indicates the number of weeks of payroll data on which the measures were calculated to address the variation in the number of weeks for which we received payroll data for each store. For the 112 respondents, data are available for an average of 25 weeks of payroll data (standard deviation [SD] = 8.64). Over two-thirds of the sample worked in stores for which we have between six and nine months of payroll data.

Results

Descriptive Analyses

Table 1 reports percentages for the dichotomous variables and the mean, standard deviation, and range for all other variables in our multivariate models. The sample is exclusively female, which is consistent with the overrepresentation of women in the broader retail industry; fully 75% of sales associates in clothing stores in the United States are female (U.S. Bureau of Labor Statistics 2012). The sample is relatively diverse by age, with

²We also constructed variables of employee Race and employee Partner's employment status. These are not included in the analyses reported here to conserve power and because they were not significant when included in the models.

Table 1. Descriptions of All Variables in Multivariate Models ($n = 112$)

| <i>Variable</i> | <i>Percentage</i> | <i>M (SD)</i> | <i>Range</i> |
|---|-------------------|---------------|--------------|
| Age | | 47.34 (13.54) | 18–74 |
| High school education or less | 42.48 | | |
| Caregiving responsibilities | 30.97 | | |
| Does not have a partner | 41.59 | | |
| Assistant manager | 21.24 | | |
| Pilot store employee | 48.67 | | |
| Number of weeks payroll data | | 24.52 (8.64) | 5–34 |
| Nonstandard work hours | | 65.05 (25.56) | 0–100 |
| Weekly hours (average) | | 19.41 (10.40) | 4.19–38.40 |
| Second job | 38.94 | | |
| Unpredictable working time variables | | | |
| Limited advance notice (one week or less) | 66.96 | | |
| Last-minute changes | | 2.62 (0.84) | 1–4 |
| Day mismatch | | 0.40 (0.27) | 0–1.57 |
| Day instability | | 0.53 (0.19) | 0–0.86 |
| Schedule input | | | |
| Input into days off | | 3.04 (0.93) | 1–4 |
| Input into days worked | | 2.78 (1.02) | 1–4 |
| Preferred working shifts | | 2.84 (0.74) | 1–4 |
| Takes preferences into account | | 3.04 (0.76) | 1–4 |
| Dependent variables | | | |
| General work–life conflict | | 2.27 (0.82) | 1–4.6 |
| Time-based conflict | | 1.70 (0.63) | 1–3 |
| Strain-based conflict (perceived stress) | | 2.26 (0.66) | 1–4.4 |

Notes: Percentages (rather than means) are listed for dichotomous variables; the mean (M), standard deviation (SD ; in parentheses), and range are provided for all other variables. Schedule input is a standardized scale made up of the four survey items listed.

approximately one-fifth 35 years of age or younger and 30% 55 years of age or older (mean Age = 47). Of the respondents, 42% had a high school degree or less and just under one-third had regular caregiving responsibilities. Forty-two percent were neither married nor living with a partner. About one-fifth of respondents were assistant managers who were paid by the hour; the rest were hourly sales associates. Just under one-half were employed by one of the nine stores that participated in the pilot intervention.

We have an average of 25 weeks of payroll data from which we calculated the working time variables not measured via the employee survey. Overall, employees in the sampled stores averaged just under 20 hours per week, with two-thirds of these hours occurring outside of standard daytime, weekday hours. Part-time employment was the norm. Almost three-fourths of employees worked in jobs classified by the firm as part-time, averaging only 14.6 hours per week (not reported in the table). However, 39% of employees who responded to the survey reported also holding a job at another place of employment.

Although the sample includes workers from a single retail chain, sufficient variation in the key independent variables exists to address the study

hypotheses. For example, the analysis shows about a two-thirds/one-third split on the Limited advance notice variable, with most respondents reporting that they knew their schedule with one week or less notice. Respondents also vary in the degree to which they experienced changes to the schedule, according to both the self-report item of Last-minute changes and the measure of actual Day mismatch calculated from the scheduling and payroll data. The average respondent reported over a half point above the midpoint of the response scale on Last-minute changes (2.62 on a four-point scale; $SD = 0.84$), and the Day mismatch variable reveals that the average employee experienced mismatch between scheduled and worked days equivalent to almost one-half day (mean = 0.40; $SD = 0.27$). The measure of Day instability (which ranges from 0 to 1) indicates that, on average, respondents had approximately a 50% probability (mean = 0.53) of working different days week to week but that the extent of the instability varied among respondents by almost 20% ($SD = 0.19$). Table 1 reports the unstandardized scores for the four items that make up the Schedule input index. The mean for each of the four Schedule input items is above 2.7 on a four-point scale, with standard deviations ranging from 0.74 to 1.02.

A correlation matrix with all the variables in the multivariate models is presented in Table 2. As we would expect, the three work–life conflict dependent variables are moderately correlated with one another (between 0.4 and 0.6). The modest correlations (less than 0.4) between the four measures of unpredictable working time and Schedule input reduce concerns that multicollinearity may bias the estimates of their unique contributions to work–life conflict.³ In addition, potentially problematic correlations appear among the control variables. Working a second job is strongly correlated (above 0.5) with both Nonstandard work hours and average Weekly hours, and the correlation between being an assistant manager and the average number of hours worked is 0.7. We include these control variables in the models for conceptual reasons. As a robustness test, we also ran a reduced model that removes the Second job and Assistant manager variables. Most of the results are unchanged; we report the few differences that result from these supplemental analyses in the next section.

Multivariate Analyses

Analytic Plan for Multivariate Regression Models

We conducted a series of ordinary least squares regressions to examine the relationship between each dependent variable and the four unpredictable

³To assess the possibility that multivariate multicollinearity may obscure the contributions of the individual independent variables to work–life conflict, we regressed each of our key independent variables (e.g., Day mismatch) on the other measures of unpredictable working time (Limited advance notice, Last-minute changes, and Day instability) and the measure of Schedule input. These models explain between 6% and 17% of the variance in the four measures of unpredictable working time and 26% in the measure of Schedule input, providing evidence that multicollinearity is unlikely to completely obscure the independent contributions of the different sources of unpredictable working time to work–life conflict.

Table 2. Correlation Matrix of All Variables in Multivariate Models

| Variable | Dependent variables | | | Unpredictability variables | | | | | Input | | | | | Control variables | | | | |
|---|---------------------|--------------------|--------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------|-------------------|-------|------|------|------|
| | WLC | TBC | SBC | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| General work-life conflict (WLC) | 1.00 | | | | | | | | | | | | | | | | | |
| Time-based conflict (TBC) | 0.49 ^a | 1.00 | | | | | | | | | | | | | | | | |
| Strain-based conflict (SBC) | 0.55 ^c | 0.42 ^c | 1.00 | | | | | | | | | | | | | | | |
| Limited advance notice (one week or less) (1) | 0.31 ^b | 0.22 ^a | 0.38 ^c | 1.00 | | | | | | | | | | | | | | |
| Last-minute changes (2) | 0.19 ^a | 0.04 | 0.09 | 0.01 | 1.00 | | | | | | | | | | | | | |
| Day mismatch (3) | 0.01 | 0.21 ^a | -0.05 | -0.11 | 0.10 | 1.00 | | | | | | | | | | | | |
| Day instability (4) | -0.29 ^b | -0.48 ^c | -0.22 ^a | -0.15 | -0.34 ^c | -0.22 ^a | 1.00 | | | | | | | | | | | |
| Schedule input (5) | -0.05 | -0.05 | -0.09 | -0.09 | -0.10 | -0.07 | -0.23 ^a | 1.00 | | | | | | | | | | |
| Nonstandard work hours (6) | 0.13 | 0.14 | -0.02 | -0.16 | 0.04 | 0.32 ^c | 0.42 ^c | -0.34 ^c | 1.00 | | | | | | | | | |
| Weekly hours (7) | 0.02 | 0.03 | 0.07 | -0.03 | -0.00 | -0.43 ^c | 0.15 | -0.02 | -0.18 | 1.00 | | | | | | | | |
| Number of weeks payroll data (8) | 0.19 ^a | 0.05 | 0.00 | -0.09 | -0.03 | 0.34 ^c | 0.25 ^b | -0.19 | -0.28 ^b | 0.71 ^c | 1.00 | | | | | | | |
| Assistant manager (9) | -0.05 | 0.04 | -0.02 | 0.03 | -0.05 | -0.01 | -0.05 | -0.06 | -0.07 | -0.11 | -0.01 | 1.00 | | | | | | |
| Age (10) | -0.18 | -0.10 | -0.20 ^a | -0.04 | -0.03 | 0.08 | 0.05 | -0.07 | 0.06 | 0.05 | 0.05 | 0.03 | 1.00 | | | | | |
| High school education or less (11) | -0.29 ^b | -0.22 ^a | -0.09 | -0.03 | -0.18 | 0.03 | -0.11 | 0.24 ^a | -0.11 | 0.05 | 0.03 | -0.06 | -0.08 | 1.00 | | | | |
| Caregiving (12) | -0.02 | -0.02 | -0.12 | 0.05 | 0.27 ^b | -0.03 | -0.08 | -0.04 | -0.04 | -0.07 | -0.13 | -0.09 | -0.16 | 0.00 | 1.00 | | | |
| Does not have a partner (13) | 0.26 ^b | -0.11 | 0.14 | 0.01 | 0.02 | -0.08 | -0.43 ^c | 0.27 ^b | 0.52 ^c | -0.62 ^c | -0.23 ^a | -0.33 ^c | 0.05 | -0.02 | -0.17 | 1.00 | | |
| Second job (14) | 0.01 | -0.23 ^a | -0.08 | -0.34 ^c | 0.06 | 0.39 ^c | 0.02 | 0.11 | -0.01 | 0.10 | -0.21 ^a | 0.06 | -0.06 | 0.06 | 0.17 | 0.10 | 1.00 | |
| Pilot store (15) | | | | | | | | | | | | | | | | | | 1.00 |

^a $p < 0.05$.

^b $p < 0.01$.

^c $p < 0.00$.

working time variables separately (Models 1 to 4), and we did the same for Hypothesis 2 with Schedule input (Model 5). We then tested the full model (Model 6), which includes the complete set of independent variables and controls.⁴ Thus, Models 1 to 6 show how each independent variable acts by itself and then which of the independent variables, relative to the others, are most powerful in explaining variation in the three work–life conflict outcomes. To estimate whether the different sources of unpredictable working time also act together to increase employees' risk of work–life conflict (Hypothesis 1a), we examined the relationship between each dependent variable and the additive Unpredictability measure (Model 7). We then tested Hypothesis 3 by adding interaction terms to assess whether the relationship between unpredictable working time and work–life conflict is weakest among workers with the greatest schedule input. We centered Schedule input and the unpredictable working time variables at their means prior to calculating the interaction terms (Aiken and West 1991). We also ran hierarchical regressions that demonstrate the amount of additional variance the bloc of the four unpredictability variables, and then the measure of Schedule input, explain in work–life conflict, after first accounting for the control variables.

All models were estimated separately for each dependent variable, as presented in Table 3 (General work–life conflict), Table 4 (Time-based conflict), and Table 5 (Strain-based conflict). The moderation models (Hypothesis 3) are not included in the tables to conserve space and because, with only one exception, the interaction terms were not statistically significant. Because the respondents were drawn from 21 stores, and hence the error terms are not independent, we adjusted the standard errors in all the models to account for the clustering of employees by store to obtain robust estimates of the standard errors (Rogers 1993; Williams 2000). Given the direction of our independent and dependent variables, we hypothesize positive associations between our dependent measures and Limited advance notice, Last-minute changes, Day mismatch, and Day instability. We hypothesize negative associations between Schedule input and our dependent variables.

General Work–Life Conflict

As Table 3 demonstrates, we found support for Hypothesis 1 that unpredictable working time is related to greater General work–life conflict as indicated by Limited advance notice, Last-minute (schedule) changes, and Day mismatch between scheduled and actual days worked (Models 1, 2, and 3). Day instability is not significantly related to General work–life conflict (Model 4).

We also found support for Hypothesis 2 that the less schedule input employees reported, the greater their work–life conflict. In the full model

⁴Because power is limited by our small sample size, we also estimated Model 6 by limiting the control variables to only those significantly related to work–life conflict. The results of these reduced-form models are consistent with those reported in the tables for the full model.

Table 3. General Work–Life Conflict

| Variable | Models | | | | | | |
|--|------------------------------|------------------------------|----------------------------|---------------------------|--------------------------------|-------------------------------|------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Limited advance notice (one week or less) | 0.50*** (0.144) [0.29] | | | | | 0.36** (0.164) [0.21] | |
| Last-minute changes | | 0.27*** (0.064) [0.28] | | | | 0.16* (0.064) [0.17] | |
| Day mismatch | | | 0.65* (0.317) [0.21] | | | 0.23 (0.290) [0.08] | |
| Day instability | | | | 0.01 (0.371) [0.00] | | -0.21 (0.355) [-0.05] | |
| Schedule input | | | | | -0.33*** (0.129) [-0.31] | -0.22** (0.135) [-0.21] | -0.26* (0.136) [-0.25] |
| Unpredictability (count variable) | | | | | | | 0.16*** (0.06) [0.20] |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 111 | 112 | 112 | 112 | 112 | 111 | 111 |
| R ² | 0.401 | 0.395 | 0.336 | 0.328 | 0.402 | 0.481 | 0.441 |

Notes: For each model, three statistics are provided per variable: unstandardized β coefficient, robust standard error (in parentheses), and standardized β coefficients [in brackets].

*indicates statistically significant at the 0.10 level; ** statistically significant at the 0.05 level; *** statistically significant at the 0.01 level.

(Model 6), two sources of unpredictability (Limited advance notice and Last-minute changes) remain statistically significantly related to General work–life conflict, as does Schedule input. The standardized coefficients indicate that Limited advance notice ($\beta = 0.21$) and Schedule input ($\beta = -0.21$) are relatively equally important in explaining variation in General work–life conflict and that Last-minute changes is slightly less so ($\beta = .17$). Model 7, which includes the count measure of unpredictability, demonstrates that the more sources of unpredictability, the greater employees' General work–life conflict, a finding consistent with Hypothesis 1a. The two models that include all measures of Unpredictability, either separately (Model 6) or as a count variable (Model 7), explain more variance in General work–life conflict than any of the models that include only one source of unpredictability or Schedule input alone (Models 1 to 5). This suggests that the sources of unpredictability add up to increase employees' risk of General work–life conflict.

Consistent with Hypothesis 3, we found evidence of an interaction between Day mismatch and Schedule input (not shown in Table 3). Specifically, for respondents with less schedule input, more mismatches between

Table 4. Time-Based Conflict

| Variable | Models | | | | | | |
|--|------------------------------|-----------------------------|---------------------------|----------------------------|--------------------------------|--------------------------------|--------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Limited advance notice (one week or less) | 0.50*** (0.132) [0.38] | | | | | 0.43*** (0.157) [0.32] | |
| Last-minute changes | | 0.15** (0.059) [0.20] | | | | 0.04 (0.056) [0.06] | |
| Day mismatch | | | 0.34 (0.292) [0.15] | | | -0.16 (0.291) [-0.07] | |
| Day instability | | | | 0.50* (0.236) [0.15] | | 0.29 (0.237) [0.09] | |
| Schedule input | | | | | -0.36*** (0.081) [-0.45] | -0.29*** (0.106) [-0.36] | -0.29*** (0.094) [-0.36] |
| Unpredictability (count variable) | | | | | | | 0.17** (0.064) [0.27] |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 111 | 112 | 112 | 112 | 112 | 111 | 111 |
| R ² | 0.257 | 0.168 | 0.144 | 0.150 | 0.286 | 0.379 | 0.352 |

Notes: For each model, three statistics are provided per variable: unstandardized β coefficient, robust standard error (in parentheses), and standardized β coefficients [in brackets].

*indicates statistically significant at the 0.10 level; ** statistically significant at the 0.05 level; *** statistically significant at the 0.01 level.

scheduled and worked time are related to greater General work–life conflict. The relationship between Day mismatch and General work–life conflict diminishes for respondents with more schedule input ($\beta = -0.50$, statistically significant at the 0.05 level; standard error [SE] = 0.16). No other interactions were significant for this dependent variable or the other two.

Time-Based Conflict

We hypothesized that unpredictable working time would be positively associated with Time-based conflict (Hypothesis 1). As with General work–life conflict, we found that respondents who reported Limited advance notice of their schedules (Model 1) and respondents who reported more Last-minute changes to their schedules (Model 2) reported statistically significantly greater Time-based conflict (see Table 4). The discrepancy between scheduled and worked days (Day mismatch) is not significantly related to Time-based conflict (Model 3); however, the greater the instability in the particular days worked from week to week (Day instability), the greater were respondents' reports of Time-based conflict (Model 4).

Consistent with Hypothesis 2, we found a significant negative relationship between Schedule input and Time-based conflict, and this relationship holds even when the unpredictable working time variables are included in the model. That is, the less Schedule input respondents report, the greater their Time-based conflict, even in the context of all other variables (Model 6) and also when the additive Unpredictability variable is entered in lieu of the separate unpredictability measures (Model 7). Of the unpredictability variables, only Limited advance notice remains statistically significantly related to Time-based conflict ($\beta = 0.32$) in the full model (Model 6); based on the standardized coefficients, it is slightly less important to Time-based conflict than is Schedule input ($\beta = -0.36$). We again found that workers who experienced more sources of unpredictability reported more Time-based conflict (Hypothesis 1a, Model 7) and that the models that include the sources of unpredictable working time, either separately (Model 6) or as the count variable (Model 7), explain more variance in Time-based conflict than any one measure of unpredictable working time or by the measure of Schedule input.

Strain-Based Conflict

We hypothesized that unpredictable working time would pose Strain-based challenges that contribute to perceived stress. As shown on Table 5, and consistent with Hypothesis 1, having Limited advance notice (Model 1), more Last-minute changes (Model 2), and greater Day mismatch between scheduled and worked days (Model 3) significantly contributes to higher levels of perceived stress. The relationship between Day instability and perceived stress is not significant (Model 4).

Consistent with Hypothesis 2, greater Schedule input is negatively associated with perceived stress (Model 5), although this relationship does not hold in Models 6 and 7. Only Last-minute changes is related to perceived stress when all measures of unpredictable working time and Schedule input are entered in the model together (Model 6). As with General work-life conflict and Time-based conflict, both Models 6 and 7 explain more variance in perceived stress (Strain-based conflict) than the other models, supporting Hypothesis 1a.

Control Variables across the Three Dependent Variables

To conserve space, the coefficients for the control variables are not included in the tables; we summarize the results here.⁵ Consistent with previous work, the more hours employees work, the greater the General work-life conflict they report, although the number of hours (Weekly hours) is not significantly associated with either Time-based or Strain-based conflict. Further, for General work-life conflict, the coefficient for number of hours worked

⁵Coefficients available from the authors upon request.

Table 5. Strain-Based Conflict

| Variable | Models | | | | | | |
|--|-----------------------------|------------------------------|-----------------------------|-----------------------------|--------------------------------|------------------------------|------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Limited advance notice (one week or less) | 0.36** (0.163) [0.26] | | | | | 0.20 (0.171) [0.15] | |
| Last-minute changes | | 0.33*** (0.068) [0.43] | | | | 0.27*** (0.069) [0.35] | |
| Day mismatch | | | 0.65** (0.235) [0.27] | | | 0.28 (0.264) [0.12] | |
| Day instability | | | | -0.10 (0.432) [-0.03] | | -0.35 (0.422) [-0.10] | |
| Schedule input | | | | | -0.26*** (0.089) [-0.31] | -0.14 (0.099) [-0.17] | -0.18 (0.097) [-0.21] |
| Unpredictability (count variable) | | | | | | | 0.22*** (0.064) [0.34] |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 111 | 112 | 112 | 112 | 112 | 111 | 111 |
| R ² | 0.180 | 0.283 | 0.147 | 0.127 | 0.202 | 0.343 | 0.292 |

Notes: For each model, three statistics are provided per variable: unstandardized β coefficient, robust standard error (in parentheses), and standardized β coefficients [in brackets].

*indicates statistically significant at the 0.10 level; ** statistically significant at the 0.05 level; *** statistically significant at the 0.01 level.

is reduced and no longer significant when we do not include job type (Assistant manager) and holding a Second job in our set of control variables. Respondents with more than one job reported significantly more General work–life conflict and higher perceived stress (Strain-based conflict) than those holding only one job. In contrast to some previous studies, Nonstandard work hours is not significantly related to the three outcomes, perhaps because working nonstandard hours was normative in this sample and because we measured the variable in the context of other dimensions of precariousness (namely schedule unpredictability).

Regarding the demographic variables, we found that respondents who did not live with a partner reported significantly lower levels of perceived stress. Respondents with more than a high school education reported more General work–life conflict and more perceived stress than those with a High school degree or less. Somewhat unexpectedly, respondents with Caregiving responsibilities reported less General work–life conflict and less Time-based conflict than those without caregiving responsibilities.

Robustness Test

The cross-sectional nature of the multivariate analyses challenges our ability to determine the directionality of the observed associations, and we can reasonably suspect that the relationships are bidirectional. For example, workers who have high levels of stress or work interferences might make last-minute schedule changes that add to the unpredictability of their work hours and that the corresponding unpredictable working time can further exacerbate work–life conflict, thus creating a vicious cycle of unpredictability and work–life conflict.

To more stringently test our hypotheses that at least part of the observed associations are from unpredictable work timing to work–life conflict, we re-estimated the core regression models (using the additive Unpredictability variable) controlling for measures of work–life conflict collected from an earlier wave of the survey, which was conducted prior to the first month for which we have payroll data, May 2008 (Table 6). Earlier measures of work–life conflict are available only for a subset of respondents ($n = 86$) who were employed at the firm at the time of the prior survey and who voluntarily participated. As with work–life conflict at time 2, work–life conflict at time 1 is likely to be jointly caused by managers' scheduling practices and workers' personal and family experiences. Thus, by allowing the measures of unpredictable working time to correlate with measures of work–life conflict from the earlier survey when estimating the relationship between these measures of unpredictable working time and time 2 measures of work–life conflict, we can effectively control for all joint variation, regardless of whether it is employee- or employer-driven. Because not all of this joint variation is likely to be due to employees' experiences of work–life conflict, the lagged models provide a conservative assessment of the importance of unpredictable working time to employee work–life conflict (Finkel 1995).

To improve power, we reduced the lagged models to include only those controls that were significantly associated with the dependent variables in earlier analyses, the Nonstandard work hours variable (for conceptual reasons), and of course our key independent variables, Unpredictability and Schedule input.

Table 6 demonstrates the robustness of the relationship between Unpredictability and the three measures of work–life conflict. Specifically, even when we controlled for earlier waves of the dependent variables, the more sources of unpredictability that respondents reported, the greater their General work–life conflict and Time-based conflict. The coefficient for Strain-based conflict is in the hypothesized direction but is no longer significant. The coefficients for Schedule input are also all in the hypothesized direction, and the variable's relationship to General work–life conflict remains statistically significant. As we might expect, the earlier indicator of each outcome is strongly and significantly related to the later indicator of the outcome, such that time 1 General work–life conflict is associated with time 2 General work–life conflict, time 1 Time-based conflict is associated with time 2 Time-based conflict, and so forth.

Table 6. Lagged Regressions Controlling for Time 1 Outcome Levels, All Dependent Variables

| <i>Variable</i> | <i>Models</i> | | |
|--------------------------------------|-----------------------------------|-----------------------------|------------------------------|
| | <i>General work–life conflict</i> | <i>Time-based conflict</i> | <i>Strain-based conflict</i> |
| Unpredictability (count variable) | 0.11*** (0.05) [0.15] | 0.16** (0.08) [0.26] | 0.07 (0.04) [0.11] |
| Schedule input | –0.19* (0.10) [–0.19] | –0.15 (0.11) [–0.19] | –0.13 (0.08) [–0.15] |
| Wave 1 WLF | 0.39*** (0.08) [0.43] | — | — |
| Wave 1 TBC | — | 0.43*** (0.11) [0.44] | — |
| Wave 1 SBC | — | — | 0.72*** (0.09) [0.68] |
| Control variables | Yes | Yes | Yes |
| Observations | 86 | 86 | 86 |
| R^2 | 0.605 | 0.434 | 0.628 |

Notes: These are reduced models. Nonstandard work hours, Weekly hours, High school education or less, and Second job were used as controls (estimates available from the authors upon request). For each model, three statistics are provided per variable: unstandardized β coefficient, robust standard error (in parentheses), and standardized β coefficients [in brackets]. SBC, Stress-based conflict; TBC, Time-based conflict; WLC, General work–life conflict.

*indicates statistically significant at the 0.10 level; ** statistically significant at the 0.05 level; *** statistically significant at the 0.01 level.

Hierarchical Regressions

To assess the amount of additional variance that the measures of unpredictable working time and the measure of Schedule input explain in work–life conflict beyond the control variables, we ran hierarchical regressions on the full sample by first entering the control variables, then the four unpredictability variables, and finally the Schedule input measure. The measures of unpredictable working time, when considered as a bloc, increase the explained variance in General work–life conflict by 12 percentage points (from 0.328 with controls only to 0.449, $p < 0.001$), in Time-based conflict by 18 percentage points (from 0.124 with controls only to 0.304, $p < 0.001$) and in Strain-based conflict by 20 percentage points (from 0.132 with controls only to 0.332, $p < 0.001$). In addition to the variation explained by the measures of unpredictable working time, Schedule input adds an additional 2.5 percentage points to the explained variance in General work–life conflict (to 0.474, $p < 0.05$) and 7.5 percentage points to Time-based conflict (to 0.379, $p < 0.001$), but only 1.3 percentage points to perceived stress (Strain-based conflict), which is not a statistically significant change.

Because hierarchical regressions are sensitive to the order in which blocs are entered, we reran the hierarchical regressions, entering the bloc of Unpredictability variables last, after the bloc of control variables and Schedule input. Even this more stringent test demonstrates that Unpredictability adds considerably to the explained variance of work–life conflict (an additional 5.3 percentage points to General work–life conflict, 10.3 percentage points to Time-based conflict, and 10.5 percentage points to Strain-based conflict). Overall, the hierarchical regression results provide further evidence that different sources of unpredictable working time add up to increase employees' risk of work–life conflict and that, regardless of how unpredictable their working time, having input into their work schedules can reduce employees' risk of work–life conflict, perhaps especially time-based conflict.

Discussion and Conclusion

Drawing on data from a sample of hourly retail employees in a national retail firm in the United States, we have examined the relationship among several sources of unpredictable working time and a set of outcomes meant to capture both time-based and strain-based work–life conflict. When considered by themselves, three of the four measures of unpredictable working time demonstrated statistically significant associations with work–life conflict in most of the core regression models. The patterns of observed relationships shed light on the possible pathways through which Greenhaus and Beutell's time-based and strain-based model of work–life conflict operate in our sample. Specifically, we found that receiving one's schedule with limited advance notice showed substantial and consistent relationships to all three measures of work–life conflict and that, when the contributions of all four measures of unpredictability were considered net of each other, Limited advance notice proved more important than the other sources of unpredictability for both General work–life conflict and Time-based conflict. Experiencing last-minute changes to the posted schedule was also consistently related to work–life conflict, especially strain-based conflict for which its contribution was even greater than that of limited advance notice.⁶ We also found evidence that exposure to unpredictability from multiple sources increased workers' vulnerability to time-based and strain-based work–life conflict. Not only was the additive Unpredictability variable significant across all three measures of work–life conflict but the explained variance was higher with the additive measure than with any individual unpredictability measure alone. The additive Unpredictability measure proved particularly robust in that it remained significant for two of the three dependent variables in our lagged models that controlled for earlier measures of work–life conflict.

⁶Post hoc tests that compared the significance of coefficients for each of our individual measures of unpredictable working time across time-based and strain-based conflict measures provide preliminary evidence that limited advance notice contributes to both time-based and strain-based conflicts, whereas changes to the posted schedule, as captured by employees' reports of last-minute schedule changes or by discrepancies between scheduled and worked days (Day mismatch), contribute to strain-based conflict only and working different days week to week (Day instability) contributes to time-based conflict only.

Our findings about the benefits of allowing employee schedule input provide a ray of hope amid this otherwise gloomy scenario of unpredictable working time. Even in a retail setting, where frontline managers face significant cost-containment pressures and have limited discretion themselves because their budgets and hours are set by higher-level management, the efforts that some managers took to consult with workers about schedules seem to have paid off in terms of employees' reduced work-life conflict. Specifically, across the models, the coefficients for input were substantial both in size and significance and, in some cases, even offset the negative associations found with unpredictable working time. When Schedule input was considered together with the unpredictability measures (both Models 6 and 7), its strength was especially evident in reducing time-based conflict. Of further interest, in a survey of managers in the same retail apparel firm studied here, we found that turnover rates were lower in stores where managers reported attending more closely to employee schedule requests than in stores where managers gave employees less input into their schedules (Lambert and Henly 2012). Taken together, this suggests that, even when accountability pressures are high, manager practices matter in ways that can benefit both workers and firms.

The robustness of our findings for Unpredictability and Schedule input is especially noteworthy given the stringent multivariate analyses to which we subjected our relatively small sample. Lagged dependent variable models, in particular, have a tendency to dramatically reduce the coefficients of substantive predictor variables (see Achen 2001); nevertheless, the additive Unpredictability variable performed especially well in these models despite the study's limited power.

Two unanticipated relationships between our control variables and work-life outcomes deserve mention. First, we found that caregiving responsibilities are negatively associated with work-life conflict. It is possible that women with substantial caregiving challenges are not employed at this firm because they are unable to successfully juggle family demands with the demands of this retail job and, as a result, they are selected out of the firm (and the sample). In addition, respondents with caregiving responsibilities who do work at this firm may have stronger support networks than respondents without caregiving responsibilities, and these support networks may help with caregiving as well as the range of employment-related challenges that are experienced by the sample as a whole. Such scenarios offer potential explanations for the negative association between caregiving and work-life conflict, but further investigation is clearly needed. Our small sample limited our ability to explore possible explanations for this unexpected finding or to reliably estimate how different types of caregiving, such as caregiving of young children or caregiving as a single parent, may be associated with the work-life outcomes.

The finding that less-educated respondents experienced lower General work-life conflict and perceived stress (Strain-based conflict) is also puzzling. If our sample came from a more diverse set of firms, this finding might

be explained by job selection effects. In this sample, however, only two occupations are represented, and job type is controlled in the models. It could be that the counterintuitive associations are the result of problematic multicollinearity, but if so, it is not reflected in the small correlations between education and all other independent variables. The possibility that workers with less education are still in high school is also not a viable explanation because all women in the sample were over the age of 18 and we controlled for age. Providing a plausible interpretation of this finding would stretch the boundaries of useful post hoc analysis.

Study Limitations

We have explored the relationships of interest within the constraints imposed by the sample size and in recognition of the biases inherent in correlational research designs. Concerns over selectivity bias, omitted-variable bias, and the possibility of reverse causality cannot be dismissed. It is especially important to consider the key study findings in light of several endogeneity concerns. For example, workers who are under significant stress and whose household routines operate with limited predictability may experience less predictable work schedules *because* their nonwork lives preclude them from having a more regular schedule. As we suggested earlier, the relationship between unpredictable working time and nonwork responsibilities may feed on one another, creating a vicious cycle that exacerbates work–life conflict. The lagged dependent variable models respond only partially to this concern. On the one hand, the lagged models may underestimate the contributions of unpredictable working time in explaining the variation in the time 2 measures of work–life conflict because all shared variance between unpredictable working time and time 1 work–life conflict are controlled when estimating work–life conflict at time 2; indeed, not all of the relationships remain significant in the lagged models. On the other hand, lagged models still provide point-in-time estimates and thus do not capture the potentially iterative process through which workers coordinate their work schedules with their personal lives.

The consequences of unpredictable working time are of special concern, especially in the United States, where a lax public policy environment governs employer–employee relationships, where only a small share of workers are covered by collective bargaining agreements, and where the welfare state is relatively weak and access to it is increasingly tied to work participation (Tilly and Carré 2011; Lambert et al. 2012; Lambert and Henly 2013). Our focus in this article has been on female hourly retail workers drawn from 21 stores in one U.S. retail chain. Retail is a growth sector, and the limited employment protections for retail workers, coupled with their disadvantaged class and gender status, make this group particularly vulnerable to the negative side of nonstandard work arrangements (Zeytinoglu et al. 2004; Clawson, Gertsel, and Crocker 2009; Lambert et al. 2012). By framing unpredictable working time as one important form of precarious

employment that can create time-based and strain-based work–life conflicts for low-skilled hourly retail workers, our aim has been to extend both the study of unpredictable working time and the reach of Greenhaus and Beutell’s classic model for understanding work–life dilemmas to include a different set of workers than is typically examined in both lines of inquiry.

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