



# The Shift Flextime Scale: a Measure of Flextime Availability, Use, and Consequences for Shift Workers

Kimberly A. French<sup>1</sup> · Mark D. Agars<sup>2</sup> · Maryana L. Arvan<sup>3</sup>

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## Abstract

We develop and validate a flexible work arrangements scale designed for use with shift workers. Consistent with research on the benefits of flexibility and nature of shift work, the scale conceptualizes flextime as predictability and control over the timing of work. The scale includes four components relevant to the experience of flextime in shift work positions: flextime availability, flextime use, interpersonal consequences, and scheduling consequences. A multi-phase approach is used to develop, validate, and pilot scale items. The final scale is used to predict work attitudes (e.g., job satisfaction, turnover intentions), individual well-being (e.g., work-family conflict, tension, sleep), and parenting (e.g., family dinner, parent-child activity) correlates that are relevant for individual and family health and well-being. The results support the proposed four-factor structure. Patterns of relationships with similar and unrelated constructs emerged as expected, providing initial evidence of scale validity. Enabling control through the availability, use, and encouragement of flexible scheduling among shift workers is associated with a variety of individual and parenting outcomes essential for maintaining health for shift workers and their family members.

**Keywords** Shift work · Flexibility · Flextime · Job attitudes · Health

Flexibility is widely touted as a tool for improving employee attitudes and well-being (Gajendran & Harrison, 2007; Waples & Brock Baskin, 2021), increasing its popularity among employers. Despite this popularity, a substantial body of research on flexibility initiatives suggests effect sizes for the associations between flexibility and work-family conflict or work-family enrichment are negligible to small (Allen et al., 2013; French & Shockley, 2020), begging the question as to why such supports are not empirically stronger predictors of the work-family interface.

One reason for small effect sizes may be that the measures used to capture family-friendly workplace supports may not generalize across types of work (Agars & French, 2016; French &

Agars, 2018; Kossek & Lautsch, 2018). Much of the flexibility research was developed within and focused on white-collar, professional workers. Consequently, flexibility initiatives have limited applicability to other forms of work, specifically shift work (Lambert et al., 2012). We define shift work as work scheduled outside of standard daytime hours (e.g., McMenemy, 2007). For example, shift workers may have flexible work times in that the start and end times of their work change, but little control or future notice regarding scheduling changes. Shift workers are currently a prominent portion of the workforce, with approximately 16% of the US labor force working nonstandard hours (e.g., evening, rotating, overnight shifts; US Bureau of Labor Statistics, 2019); industries employing shift workers will only continue to increase (Henderson, 2013). Thus, understanding flexibility as it is enacted in shift work is an important concern for a substantial portion of the workforce.

The purpose of the current study is to develop measures that provide a comprehensive and accurate depiction of flextime as it is enacted in shift work. Specifically, using data from two studies, we develop and provide initial validity evidence for the Shift Flextime Scales (SFS). In line with the broader work flexibility literature, the SFS measures shift flexibility specifically in terms of shift flextime (1) availability (ability to schedule work

Additional supplementary materials may be found here by searching on article title <https://osf.io/collections/jbp/discover>.

✉ Kimberly A. French  
KFrench0429@gmail.com

<sup>1</sup> School of Psychology, Georgia Institute of Technology, Atlanta, GA, USA

<sup>2</sup> Department of Psychology, California State University, San Bernardino, CA, USA

<sup>3</sup> Raymond James, St. Petersburg, FL, USA

in a way that accommodates family needs); (2) use (changing work schedules to accommodate family needs); (3) interpersonal consequences (damage to interpersonal relationships at work as a result of changing work schedules); and (4) scheduling consequences (damage to future scheduling opportunities as a result of changing work schedules).

The SFS makes several notable contributions. First, the SFS allows researchers and practitioners to assess flextime in shift work positions. Such positions are historically underrepresented in the work-family literature in part because measurement tools are not developed for assessing work-family phenomena in shift work contexts. Additionally, the SFS taps into specific scheduling perceptions and behaviors, as opposed to global perceptions of schedule control. Our measure provides respondents with concrete examples that are appropriate for shift work positions, allowing researchers to assess specific schedule control behaviors. Such specificity may be useful for diagnosing scheduling flextime issues and designing interventions for improving shift work flexibility. The SFS also uniquely captures consequences associated with using flextime in shift work. Consequences have been discussed as an influential negative outcome for scheduling flexibility use among shift workers (Lambert et al., 2012). However, researchers have yet to consider this aspect of flexibility in quantitative work, particularly within the shift work context. Using the SFS, we examine relationships between shift work flextime availability, use, and consequences with organizational, individual, and parenting outcomes relevant for performance and health. In doing so, we replicate and extend findings on the benefits of flextime found in typical professional worker samples. We also meaningfully extend the flexibility literature to under-explored correlates with implications for individual and child health maintenance. We hope this extension not only strengthens our empirical and theoretical knowledge regarding flextime and its generalizability, but also helps to advocate for policies and practices that promote flex-time within shift work positions (see also, Rummler & The 19th, 2021; Schneider & Harknett, 2019a).

## Flexible Work Arrangements

Flexible work arrangements are arrangements that give employees discretion over when, where, and how long they engage in paid work (Hill et al., 2008; Kossek & Michel, 2011). There are two forms of flexibility: flextime (control over timing of work) and flexplace (control over where work is done). We use the broader term “flexibility” throughout this paper to refer to both flextime and flexplace. There is also an important distinction between flexibility availability and use (Allen et al., 2013). Although

flexibility opportunities may be available in an organization, employees may be unable or unwilling to use these opportunities due to restrictions, lack of need, or lack of organizational support for flexibility policies (French & Shockley, 2020; Perrigino et al., 2018; Ryan & Kossek, 2008).

Availability and use of flexible work arrangements are theoretically positioned as a supportive employee resource, in that flexibility allows workers greater control over where and when to allocate time, attention, and energy resources (Allen et al., 2013; French & Shockley, 2020). Because time, energy, and attention resources are necessary to manage both work and family (Edwards & Rothbard, 2000; Grandey & Cropanzano, 1999; ten Brummelhuis & Bakker, 2012), people with flexibility should be better able to meet work and home demands and have less conflict between their work and family roles. For example, a flexible start time might allow a parent to take their child to school, while also meeting their employer’s expectations. In this way, flexibility also serves as a resource that improves attitudes and well-being. When individuals are able to re-arrange time, attention, and energy in a way that suits their demands, they may feel more positive and satisfied with their work and home lives (Casper et al., 2018; Hill et al., 2008), and they reduce stress and burden associated with difficulties managing work and family (Allen et al., 2013). Even simply offering flexible work arrangements can serve as a powerful signal of employee support, engendering positive feelings toward the job and organizational attachment (Casper & Harris, 2008; Grover & Crooker, 1995; Scandura & Lankau, 1997). This idea is echoed in several resource-based occupational health theories. For example, conservation of resources (Hobfoll, 1989), the job-demand-control-support model (Karasek, 1979), the job-demands-resources model (Demerouti et al., 2001), and the work-home resources model (ten Brummelhuis & Bakker, 2012) each theorize support and control are critical resources for addressing work (and home) demands and for reducing worker strain associated with these demands.

In line with the theoretical role of flexibility as a supportive resource, availability and use of flexible work arrangements have a number of benefits for worker well-being and productivity (Allen et al., 2015; Baltes et al., 1999; French & Shockley, 2020; Gajendran & Harrison, 2007). For example, research suggests positive benefits such as increased job satisfaction, greater sense of control, and reduced turnover intentions (e.g., Gajendran & Harrison, 2007; Kelly et al., 2011; Moen et al., 2011; Scandura & Lankau, 1997). Meta-analytic evidence also suggests flexibility availability and to a lesser extent use are positively, albeit weakly, associated with work-family conflict (Allen et al., 2013) and work-family enrichment (Lapierre et al., 2018). Flexibility use and availability are also associated with individual health and well-being. For example,

studies find associations with reduced stress, burnout, and fatigue (Gajendran & Harrison, 2007; Hill et al., 2008; Kim et al., 2020), as well as improved happiness (Golden et al., 2013) and sleep quality (Haley & Miller, 2015). A recent field-based randomized controlled trial from the Work, Family, and Health Network showed a flexibility and support intervention reduced turnover intentions in part through reductions in work-family conflict, burnout, and stress (Moen et al., 2017).

A relatively smaller literature also suggests flexibility has downstream effects on child health and well-being through parenting behavior (c.f., Cho & Ciancetta, 2016). For example, flextime availability has been associated with increased parent-child time for mothers and fathers (Kim, 2020), and flexplace use has been associated with increased parent-child time for mothers (Genadek & Hill, 2017; Kim, 2020; although Roeters et al., 2010 finds no relationship with flexibility availability). The Work, Family, and Health Network flexibility and support intervention produced increases in parent-child time, particularly for mothers (Davis et al., 2015). Finally, a longitudinal study found mothers' perceptions of flextime availability are associated with child sleep duration, mediated by child bedtime adherence (Lee et al., 2019).

Flexibility benefits are particularly important for shift workers given that non-standard schedules are associated with disproportionately poorer individual and child health and well-being compared to standard-hour workers (Bolino et al., 2021; Goh et al., 2016; Li et al., 2014; Schneider & Harknett, 2019b; Strazdins et al., 2006). Additionally, non-standard schedules are negatively related to maternal sensitivity and quality home environment (Grzywacz et al., 2011), overall parenting quality (Haines et al., 2020), child cognitive outcomes (Han, 2005), and child behavioral problems (Schneider & Harknett, 2019a). In sum, there is a clear need to consider flextime for shift workers due to its potential to improve individual and family outcomes.

## Flexibility as Enacted in Shift Work

The applicability of flexible work arrangement concepts to shift work positions is debatable. Shift workers typically do not have access to flexplace arrangements, as shift work positions often require workers to be onsite (Swanberg et al., 2008). We therefore limit our focus to flextime. Some argue shift work in itself is a flextime arrangement, as shift work is characterized by fluctuating work hours (Kossek & Michel, 2011). Additionally, flextime arrangements may be available to shift workers, such as compressed work week (Smith & Wedderburn, 1998), reduced work hours, and changing availability (Swanberg et al., 2008).

Others argue the flexibility allotted by shift work is not consistent with flexible work arrangement assumptions (Lambert et al., 2012, 2014). Under the traditional conceptualization, flextime allows employees control over the timing of work to accommodate family responsibilities (Kossek & Michel, 2011). In contrast, shift work is often highly variable, unpredictable, and not under the employee's discretion (Henly & Lambert, 2014; Henly et al., 2006; Lambert et al., 2014; Swanberg et al., 2005). Shift workers who exert control over their schedule may be punished via reduced hours, less desirable shifts, and denied requests for schedule changes (Lambert et al., 2012). Additionally, shift workers most typically rely on their coworkers for flextime, and use of flextime for one worker may increase workload for others. Thus, exerting control has the potential to strain interpersonal relationships and create backlash (Lambert et al., 2012; Ryan & Kossek, 2008). Finally, some flextime options (e.g., deciding start and end times) are typically not available due to work design (Watson & Swanberg, 2011).

Flextime in shift work may be better conceptualized as schedule control (Swanberg et al., 2011). Similar to traditional flexibility conceptualizations, flextime in shift work can be divided into flextime availability and flextime use (Allen et al., 2013). Qualitative research shows shift workers exert control over work time informally by exchanging shifts with coworkers, requesting time off, and having predictable schedules that are received far in advance (French et al., 2014; Henly & Lambert, 2014; Henly et al., 2006; Swanberg et al., 2008). Thus, we define shift *flextime availability* is the extent that employees can easily arrange their work schedules to meet family responsibilities. This includes knowing schedules in advance, having input into scheduling decisions through heeded requests off and changes in availability, and the ability to make last-minute changes to work schedules (Henly & Lambert, 2014; Henly et al., 2006; Lambert et al., 2012; Swanberg et al., 2008). Shift *flextime use* is the extent to which employees engage in schedule change behaviors to meet family needs.

Similar to salaried positions, shift workers may be punished when trying to gain schedule control (French et al., 2014; Lambert et al., 2012). Such punishment has been identified and reflected in other measures of family supportive workplaces (Allen, 2001; Thompson et al., 1999). These measures largely focus on career consequences; however, shift workers may have far fewer opportunities for career advancement (Weigt & Solomon, 2008). Instead, shift workers may be punished by management limiting their work hours, allotting them less desirable work hours, or not accommodating their requests (French et al., 2014; Lambert et al., 2012). We label these as shift *flextime scheduling consequences*, defined as perceptions of negative consequences for future scheduling as a result of using shift flextime. Shift workers might also receive interpersonal punishment from

coworkers, whose workload may increase or become less stable as a result of another coworker's flextime requests (French et al., 2014; Lambert et al., 2012). We label these as shift *flextime interpersonal consequences*, defined as perceptions of negative interpersonal consequences as a result of using shift flextime. Our distinction recognizes the consequences of using shift flextime might manifest in two distinct forms.

Measures of schedule control are available in our online OSF website.<sup>1</sup> A review of these measures reveals two major limitations that we build upon to assess flextime as it is enacted in shift work (i.e., schedule control); these limitations apply to all but two measures (Henly & Lambert, 2014; Swanberg et al., 2011). First, measures contain irrelevant items (e.g., Monday through Friday 9 AM to 5 PM schedule, Berman, 1997; individually customized work schedule, Hornung et al., 2008; ability to change start and end times, Hyland, 2000). Shift workers likely do not hold traditional schedules and may not have direct ability to change start/end times. Instead, shift workers enact flexibility by putting in and receiving requested availability or having consistent schedules communicated well in advance.

Second, many scales are generic and ambiguous, using a single or few items to assess overall perceptions of flexibility or control over working hours (average of 4 items per scale, 57% of the reviewed scales of one or two items) (e.g., Aryee et al., 1999). Control perceptions may be more accurately measured with specific behaviors (e.g., putting in scheduling requests) or perceptions (e.g., likelihood that the organization will accommodate requests), as opposed to single-item global perceptions. Specific items are also more useful for diagnostic purposes (e.g., assessing which flextime behaviors are used and which are not).

Finally, measures rarely capture flextime use, focusing instead almost exclusively on availability (e.g., Galovan et al., 2010; Swanberg et al., 2011). None of the studies reviewed capture flextime consequences. Previous studies also create measures in an ad hoc fashion, with little to no explicit validation (e.g., Henly & Lambert, 2014; Swanberg et al., 2011). Although researchers may be tempted to adapt existing scales (e.g., by removing irrelevant items, for example Griggs et al., 2013), this practice creates a new scale that lacks validation evidence and introduces potential construct contamination and/or deficiency (Aguinis & Vandenberg, 2014; Heggstad et al., 2019). A validated measure that is specifically developed for the context of interest is therefore preferable to post hoc scale adaptation.

## Present Study

The present study seeks to develop measures that capture flextime as it is enacted in shift work. Specifically, we use a deductive approach (Hinkin, 1998) to develop four factors to capture aspects of flextime based on existing quantitative and qualitative literature detailing shift work schedule control and flextime (e.g., Henly et al., 2006; Swanberg et al., 2008): flextime availability, flextime use, interpersonal consequences, and scheduling consequences.

While each of these subfacets is imperative for capturing flextime for shift workers, we intend for each of the four subfacets to be conceptually and empirically distinct, rather than reflect an underlying superordinate construct. Each subfacet also ought to be directly associated with work, family, and/or health outcomes as each serves as a means of facilitating or signaling control and support (flextime availability, use) or thwarting/signaling lack of control and support (interpersonal and scheduling consequences) (e.g., French & Shockley, 2020). Furthermore, the four subfacets are posited as related, consistent with previous theory and empirical literature on formal and informal supports (e.g., French & Shockley, 2020).

To gather evidence for construct validity, we examine relationships between the SFS facets and several groups of correlates across two samples. We assess convergent validity by examining whether the SFS are correlated with other measures of schedule control. Specifically, we chose three measures that represented the range of schedule control measures found in our review (Beutell, 2010; Swanberg et al., 2011; Thomas & Ganster, 1995). Note that all three measures tap into schedule availability; and thus, we expect especially high correlations between our flextime availability scale and the three existing control measures. We also attempted to find convergent measures for flextime use, interpersonal consequences, and scheduling consequences. However, the existing measures that included flextime use (Beham et al., 2011; Hyland, 2000) also included items inappropriate for shift work contexts and were therefore not used in this study, and no measures captured interpersonal or scheduling consequences.

We also examined popular and similar measures of family support in the workplace: family supportive supervisor behavior (FSSB) (Hammer et al., 2013) and family supportive organizational perceptions (FSOP) (Allen, 2001). Like the SFS, FSSB assesses supportive behaviors. However, FSSB focuses exclusively on the supervisor, and captures facets of support, rather than scheduling control (Hammer et al., 2009). FSOP (Allen, 2001) focuses on perceptions of support from the organization, but does not assess availability or use of supports, nor does it capture specific behaviors that stifle flextime use. Thus, these

<sup>1</sup> [https://osf.io/u4dfg/?view\\_only=41acc39d19c447e68dd0389b45bccd7e](https://osf.io/u4dfg/?view_only=41acc39d19c447e68dd0389b45bccd7e)

existing constructs are related, but distinct, from the SFS facets. Theoretically, they serve similar mechanisms for improving work, family, and individual well-being in that they are thought to allow autonomy and resources needed to facilitate positive perceptions of the working environment, navigate work-family conflict, and meet personal needs (Allen, 2001; Beutell, 2010; Crain & Stevens, 2018; French & Shockley, 2020). Thus, for Hypotheses 1 and 2, we expect shift work flextime availability and use are positively associated with (a) schedule control availability, (b) FSSB, and (c) FSOP, albeit not to a degree that would imply redundancy. For Hypotheses 3 and 4, we expect interpersonal and scheduling consequences are negatively associated with (a) schedule control availability, (b) FSSB, and (c) FSOP.

We also examine discriminant validity by correlating the SFS scales with several individual differences, including personality factors and demographic factors. Flextime availability, use, and consequences are most likely to vary as a function of workplace policies and practices, rather than based on individual worker characteristics. We are also unaware of data or theory that might suggest flextime will meaningfully differ based on individual differences such as age, gender, or personality. We therefore expect there to be non-significant and small correlations between shift work flextime availability, use, interpersonal consequences, and scheduling consequences and individual differences such as demographic and personality factors.

Finally, we examine theoretically derived correlates to test criterion-related validity. As reviewed above, flextime is theoretically positioned as a resource that allows workers autonomy and control over working time (Allen et al., 2013). The availability of flextime and a family-friendly culture that supports use of flextime also communicates support for personal and family well-being (French & Shockley, 2020; Grover & Crooker, 1995). Thus, workers who have flextime available and who use flextime policies are more likely to feel supported in prioritizing their personal and family needs and empowered to change their working hours to better juggle work, family, and personal demands (e.g., French & Shockley, 2020; Gajendran & Harrison, 2007; Henly & Lambert, 2014; Scandura & Lankau, 1997). Conversely, workplaces that stigmatize or punish workers for flextime create a culture in which workers may feel unsupported and unable to prioritize personal and family demands (Perrigino et al., 2018; Thompson et al., 1999). Consequently, this lack of support and control communicated by negative interpersonal and scheduling consequences may reduce workers' attitudes and attachment at work, increase stress, and reduce psychological and temporal capacity to engage in parenting (e.g., Galinsky et al., 1996; Repetti & Wang, 2014; Thompson et al., 1999). For Hypotheses 5 and 6, we therefore posit flextime availability and use will be positively associated with better worker attitudes ((a)

increased job satisfaction, (b) reduced turnover intentions, (c) increased work engagement), health and well-being ((d) reduced work-to-family conflict, (e) reduced family-to-work conflict, (f) reduced tension, (g) reduced anxiety, (h) increased health maintenance behaviors, (i) increased sleep hours, (j) increased sleep quality, (k) reduced absenteeism, (l) reduced presenteeism), and parenting outcomes ((m) increased family dinner, and (n) increased parent-child activities, (o) reduced parental overload, (p) reduced child consumption of convenience food). For Hypotheses 7 and 8, we also posit flextime interpersonal and scheduling consequences will be negatively associated with the same worker attitudes, individual well-being, and parenting correlates.

Our measurement development procedure and analyses were informed by best practice recommendations (Hinkin, 1995, 1998). We begin with item generation and content validation, followed by two survey studies of shift workers to refine the scale items and establish psychometric, convergent, discriminant, and criterion-related validity. All SFS items, syntax, code, and R Markdown output files detailing all analyses described in this paper are available at our OSF study website; data is available from the first author upon request. For simplicity, we show full results for select analyses which are most critical for interpreting findings and using the SFS in future work.

## Study 1 Method

### Part 1: Item Generation and Content Validation

First, the first two authors generated items to tap into each of the four distinct characteristics of shift flextime: availability, use, interpersonal consequences, and scheduling consequences. Items were informed by the definitions of each facet, as well as existing schedule control scales. Both authors are PhD-level experts in the work-family field, with particular expertise in shift work and low-income populations, as well as training in psychometrics and measurement development. Item generation yielded an initial pool of 35 items.

To establish content validity and item clarity, seven subject matter experts (SMEs) sorted items into their respective categories based on construct definition. SMEs included PhD-level researchers and graduate students with expertise in work-family and/or shift work. SMEs also provided feedback on clarity of instruction and item wording, content deficiency, and contamination. Items were reviewed for omission or revision if two or more SMEs incorrectly categorized the item, or if any one SME indicated a lack of clarity, deficiency, or contamination. Based on SME feedback, two items were removed, 17 items were revised, one new item was written, and 16 items were retained, resulting in a pool of 34 items (see our OSF study website).

## Part 2: Pilot Test

The content validated measure was pilot tested to establish psychometric validity and convergent and discriminant validity.

### Participants and Procedure

Participants ( $N = 293$ ) were individuals working at least 20 h per week in a position with non-traditional hours (working nonstandard hours such as early morning, evening, night, or weekend hours; Henly & Lambert, 2014), and who were married and/or had a child. All participants were recruited through online student participant pools and courses from one of two university settings in the Southeastern and Southwestern United States. Students recruited through courses had the option to find an eligible participant (snowball recruitment) or complete surveys themselves if eligible. In addition to meeting the eligibility criteria, participants had to correctly respond to three bogus items (e.g., “Please respond ‘Strongly Agree’ to this item.”) to ensure quality control. The sample was predominantly female (77%), with 57% reporting to be Hispanic<sup>2</sup> and 26% reporting White/non-Hispanic. Participants worked in their current organization for an average of 3 years and reported an average of 29 work hours per week. Sixteen percent of participants ( $n = 48$ ) reported having a second job that they worked at an average of 20.27 h per week. Ages ranged from 18 to 65 ( $mean = 24$ ). Most participants were married or in a committed relationship (84%), and 41% had children. Most had an Associates (54%) or Bachelors (14%) degree, while 29% had a high school degree or GED, and 98% were currently enrolled in an educational institution. All measures were completed via an online survey that took fewer than 30 min to complete. Participants (or course snowball recruiters) received extra credit for completed surveys.

### Measures

See Table 1 for variable citations, number of observations, anchors, and Cronbach’s alpha values.

<sup>2</sup> Because most participants held a higher education degree and were enrolled in an English-speaking educational institution, we had limited concerns regarding English-language comprehension.

## Study 1 Results

### Psychometric Validity and Item Reduction

First, psychometric properties of the SFS were examined, including descriptive statistics, item analysis statistics, and confirmatory factor analysis to examine reliability and confirm the hypothesized factor structure. Because the constructs are proposed as related, but not indicative of an underlying higher-order latent factor, it is expected a correlated four-factor solution will provide the most appropriate fit for the data. To examine the factor structure, we conducted multiple confirmatory factor analyses (CFA; ML estimation) using lavaan in R with the 34 flextime items (R Core Team, 2020; Rosseel, 2012).<sup>3</sup> We tested a single-factor model, a three-factor model where all consequence items comprised a single factor, and the predicted four-factor model. Models were compared using the difference in chi-square test; a significant decrease in chi-square and increase in CFI  $> 0.01$  is considered evidence of improved model fit (Cheung & Rensvold, 2002). The four-factor model demonstrated the best fit to the data ( $\chi^2(521) = 1502$ , CFI = 0.87, RMSEA = 0.08, SRMR = 0.06), and was significantly improved from the three-factor model in which all interpersonal and scheduling consequences items were loaded onto a single consequences factor ( $\Delta \chi^2(3) = 480$ ,  $p < 0.01$ ,  $\Delta CFI = 0.07$ ) (see our OSF website for items and loadings). All of the factor loadings were statistically significant ( $p < 0.01$ ) and standardized loadings ranged from 0.37 to 0.90.

To identify items for the final scale, we considered item content and redundancy and empirical recommendations (i.e., loadings; Allen & Yen, 2001). We also consulted modification indices, which showed item redundancy (covariation among item errors within a given facet) was the primary source of misfit. We eliminated fifteen items, resulting in a final 19-item scale. We confirmed the final items using a four-factor CFA. The final model adequately fit the data ( $\chi^2(164) = 424$ , CFI = 0.94, RMSEA = 0.07, SRMR = 0.05). Factor loadings ranged from 0.51 to 0.90 ( $p < 0.01$ ). Final

<sup>3</sup> We opted for a CFA because we developed items with a theoretical a priori structure and SME reviews provided strong evidence of our intended structure. Our choice of CFA is also consistent with Hinkin’s (1995) best practice recommendations because it “allows the researcher more precision in evaluating the measurement model” (p. 977) and allowed for more direct alternative model testing to confirm the proposed factor structure. Post hoc EFA results are available in our online OSF page. Given our theoretical understanding, CFA model comparisons supporting the four-factor structure, subsequent replication of our factor structure, and validity evidence that the two consequences dimensions are distinct, we feel confident that the four-factor structure is most appropriate for the scale.

**Table 1** Study 1 and Study 2 measures

Variable	Citation	Number of Items	Anchors	Study 1 $\alpha$	Study 2 $\alpha$
<i>Shift work flexibility scale (SFS)</i>					
Flextime availability	Study developed <sup>a</sup>	6	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.86	.86
Flextime use	Study developed <sup>a</sup>	3	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.64	.73
Interpersonal consequences	Study developed <sup>a</sup>	4	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.78	.81
Scheduling consequences	Study developed <sup>a</sup>	6	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.93	.91
<i>Convergent variables</i>					
Schedule control- Beutell (2010)	(Beutell, 2010)	1	1 <i>no control</i> – 5 <i>complete control</i>	NA	NA
Schedule control- Thomas and Ganster (1995)	(Thomas & Ganster, 1995)	6	1 <i>no control</i> – 5 <i>complete control</i>	.73	.82
Schedule control- Swanberg et al. (2011)	(Swanberg et al., 2011)	3	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.79	.83
Family supportive organizational perceptions (FSOP)	(Allen, 2001) <sup>b</sup>	10	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.83	.83
Family supportive supervisor behaviors (FSSB)	(Hammer et al., 2013)	4	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.92	.91
<i>Discriminant variables</i>					
Age	Study developed	1	Entered numeric value	NA	NA
Gender	Study developed	1	1 <i>male</i> , 2 <i>female</i> , 3 <i>other</i> <sup>c</sup>	NA	NA
Education	Study developed	1	1 <i>some high school</i> – 6 <i>graduate degree (MA, PhD)</i>	NA	NA
Work Hours	Study developed	1	Entered numeric value	NA	NA
Job Tenure (in years)	Study developed	1	Entered numeric value	NA	NA
Extraversion	(Donnellan et al., 2006) <sup>d</sup>	4	1 <i>very inaccurate</i> – 5 <i>very accurate</i>	.79	
Agreeableness	(Donnellan et al., 2006) <sup>d</sup>	4	1 <i>very inaccurate</i> – 5 <i>very accurate</i>	.69	
Conscientiousness	(Donnellan et al., 2006) <sup>d</sup>	4	1 <i>very inaccurate</i> – 5 <i>very accurate</i>	.60	
Openness to new experience	(Donnellan et al., 2006) <sup>d</sup>	4	1 <i>very inaccurate</i> – 5 <i>very accurate</i>	.64	
<i>Study 1 correlates<sup>e</sup></i>					
Job satisfaction	(Cammann et al., 1983)	3	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.92	.93
Turnover intentions	(Cammann et al., 1983)	3	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.91	.93
Engagement	(Schaufeli et al., 2006)	17	1 <i>never (never)</i> – 7 <i>always (every day)</i>	.94	.94
Work interference with family (WIF)	(Netemeyer et al., 1996)	5	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.91	.91
Family interference with work (FIW)	(Netemeyer et al., 1996)	5	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>	.87	.89
Tension	(Lovibond & Lovibond, 1995)	7	1 <i>did not apply to me at all</i> – 4 <i>applied to me very much or almost all the time</i>	.87	.90
Anxiety	(Lovibond & Lovibond, 1995)	7	1 <i>did not apply to me at all</i> – 4 <i>applied to me very much or almost all the time</i>	.90	.85
<i>Study 2 health correlates<sup>e</sup></i>					
Health maintenance behaviors	(Jayanti & Burns, 1998)	9	1 <i>never</i> – 5 <i>always</i>		.79
Sleep hours	(Buysse et al., 1989)	1	Entered numeric value		NA
Sleep quality	(Buysse et al., 1989)	1	1 <i>very bad</i> – 4 <i>very good</i>		NA
Absenteeism	Study developed	1	Number of times called off of work in the last month		NA
Presenteeism	(Johns, 2011)	2	1 <i>strongly disagree</i> – 5 <i>strongly agree</i>		.95
<i>Study 2 parenting correlates<sup>e</sup></i>					
Family dinner	(Allen et al., 2008)	1	1 <i>less than or equal to once per week</i> – 5 <i>more than twice per day</i>		NA
Parent–child activities	(Cho & Allen, 2012)	13	1 <i>never</i> – 7 <i>26 times or more per month</i>		.90
Parent overload	(Thiagarajan et al., 2006)	5	1 <i>never</i> – 5 <i>always</i>		.87
Convenience food consumption	Study developed based on (Collins et al., 2010)	2	1 <i>less than or equal to once per week</i> – 5 <i>more than twice per day</i>		.62

<sup>a</sup>Description for final SFS items and Chronbach's alpha values. Study 1 began with 21 flextime availability items, 4 flextime use items, 6 interpersonal consequences items, and 12 scheduling consequences items. All items are available on our OSF study website. <sup>b</sup>Similar to previous research (Griggs et al., 2013), we removed four items because they did not apply to the target population (i.e., shift workers; for example, "Long hours inside the office are the way to achieving advancement"). <sup>c</sup>We recoded all "other" values as missing. <sup>d</sup>Emotional stability was measured but omitted due to poor reliability ( $\alpha = .45$ ). <sup>e</sup>For Study 2, items referred to the last month

items and removal rationale can be found on our OSF website.

### Convergent, Discriminant, and Criterion-Related Validity

First, we distinguished shift work flextime measures from similar family supportive constructs: FSSB and FSOP. A measurement model with six correlated factors demonstrated acceptable fit ( $\chi^2(512)=985.11, p < 0.01, CFI=0.93, RMSEA=0.05, SRMR=0.07$ ) (Hu & Bentler, 1999), supporting the conclusion that the SFS facets are distinct from FSSB and FSOP.

Second, we examined correlations to determine convergent and discriminant validity (see Tables 2 and 3). For convergent validity, we expected SFS facets to have significant positive correlations with existing schedule control measures, FSSB, and FSOP (Hypotheses 1–4 a–c). This pattern of correlations emerged as expected, with correlation magnitude ranging from 0.15 (flextime use and FSOP) to 0.69 (flextime availability and schedule control measured by Swanberg and colleagues (2011)). Hypotheses 1–4 a, b, and c received support. For discriminant validity, we expected the SFS facets to have weak and non-significant correlations with individual differences, namely the Big Five personality traits and demographics (age, gender, education, work hours, tenure). Although some discriminant correlations were significant, effect sizes were weak ( $r < \text{or} = 0.16$ ). Thus, the results supported discriminant validity.

Third, we examined relationships between the SFS facets and correlates, namely job satisfaction, turnover intentions, engagement, WIF, FIW, tension, and anxiety (Table 3). We expected flextime availability and use to be associated with desirable outcomes (higher satisfaction and engagement, and lower turnover intentions, WIF, FIW, tension, and anxiety) and interpersonal and scheduling consequences to have opposite valence relationships (Hypotheses 5–8 a–g). In general, shift work flextime availability and use were positively associated with desirable correlates, and scheduling and interpersonal consequences were negatively associated with desirable correlates as predicted ( $p < 0.05$ ; Table 3). Hypotheses 5 (flextime availability and correlates) and 7 (flextime interpersonal consequences) received full support, while Hypotheses 6 (flextime use and correlates) received support for four of the seven correlates, and Hypothesis 8 (flextime scheduling consequences and correlates) received support for six correlates. Consistent with previous research (T. D. Allen et al., 2013), shift work flextime use appeared most weakly associated with correlates; relationships with FIW, tension, and anxiety were not significant ( $p > 0.05$ ). Thus, Hypothesis 6 e–g did not receive support. Scheduling consequences was also not related to tension ( $p = 0.10$ ). Thus, Hypothesis 8f did not receive support.

### Incremental Variance Explained

Fourth, we investigated the extent to which the SFS facets explained variance in correlates above and beyond other schedule control measures. Full results are available on our OSF website, and summarized results can be found in Table 4. Flextime availability explained additional variance in job attitudes (job satisfaction, turnover intentions, and work engagement) as well as WIF, but not FIW, tension, or anxiety. Similarly, interpersonal and scheduling consequences explained variance in all correlates except tension (and anxiety for interpersonal consequences). Finally, flextime use did not explain additional variance for any correlates.

We also investigated whether SFS facets explained variance in correlates above and beyond FSSB and FSOP. Results were similar to those controlling for schedule control measures. Flextime availability explained additional variance in all correlates except FIW and tension. Interpersonal consequences explained additional variance in all correlates except work engagement and tension. Scheduling consequences only explained additional variance in WIF, FIW, and anxiety. Finally, flextime use only explained additional variance in WIF.

### Relative Importance

To further explore the relative importance of the SFS subscales, we ran dominance analyses. We ran dominance analysis using the *domir* package in R (Luchman, 2022). Results can be found in Table 6. We found consistent support for the idea that availability was more important than use for our correlates of interest among shift workers. In fact, use was consistently ranked last among the SFS subscales, accounting for 7% or less of the explained variance in any one correlate. For work attitudes and tension, flextime availability (28–44% of explained variance) and interpersonal consequences (27–43% of explained variance) are most important for explaining variance. Similarly, flextime availability explained the largest portion of variance in WIF (39%), followed by interpersonal consequences (27%) and scheduling consequences (26%). For non-work related correlates (FIW, anxiety), scheduling consequences (37–61% of explained variance) and interpersonal consequences (25–35% of explained variance) tend to be most dominant, followed by flextime availability (10–21% of explained variance).

### Study 1 Conclusion

Overall, the findings support content validity and psychometric structure of the SFS, and convergent, discriminant, and criterion correlates were generally related as expected. Each



**Table 2** Study 1 ( $N = 293$ ) and Study 2 ( $N = 199$ ) bivariate correlations

Variable	Study 1		Study 2		1	2	3	4	5	6	7	8	9	10
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>										
1. Flextime availability	3.44	0.79	3.54	0.82		.64**	-.69**	-.32**	.46**	.48**	.67**	.38**	.51**	
2. Flextime use	3.30	0.79	3.29	0.91	.60**		-.45**	-.03	.43**	.46**	.50**	.22**	.28**	
3. Flextime interpersonal consistency	2.60	0.85	2.45	0.83	-.71**	-.49**		.50**	-.28**	-.29**	-.61**	-.50**	-.41**	
4. Flextime scheduling consistency	3.03	0.97	2.64	1.01	-.49**	-.27**	.51**		.01	-.04	-.40**	-.56**	-.26**	
5. Schedule control (Beutell)	3.02	0.99	2.91	1.23	.58**	.46**	-.53**	-.35**		.78**	.46**	.20**	.24**	
6. Schedule control (Thomas)	2.54	0.74	2.83	0.99	.45**	.35**	-.43**	-.25**	.61**		.47**	.22**	.29**	
7. Schedule control (Swanberg)	3.56	0.84	3.49	0.92	.68**	.49**	-.67**	-.41**	.58**	.54**		.44**	.45**	
8. FSOP	3.29	0.67	3.16	0.73	.36**	.18**	-.40**	-.54**	.28**	.23**	.31**		.46**	
9. FSSB	3.30	1.11	3.45	1.05	.52**	.33**	-.58**	-.43**	.48**	.41**	.50**	.36**		
10. Age	24.45	5.48			.12*	.02	-.06	-.11	.08	.08	.05	.07	.05	
11. Gender	0.77	0.42	0.58	0.49	-.04	-.08	.10	.18**	-.03	.01	-.06	-.08	-.10	-.20**
12. Education	3.52	1.07	4.23	1.53	.00	-.05	.06	.03	.01	-.01	-.04	-.03	-.08	.33**
13. Tenure (in years)	3.22	2.54	6.52	5.47	-.09	-.13	.04	-.12	-.03	.04	-.01	.07	-.04	.44**
14. Work hours per week	28.54	7.28	39.14	9.38	-.07	-.04	.10	-.02	-.02	-.03	-.06	-.02	-.04	.11
15. Extraversion	3.24	0.94			.06	.02	-.11	-.02	.13*	.09	.12*	.01	.01	-.05
16. Agreeableness	3.89	0.74			.13*	.05	-.16*	-.11	.16*	-.03	.07	.11	.09	.02
17. Conscientiousness	3.81	0.72			.09	.13*	-.16*	-.00	.06	-.07	.09	.07	.07	.09

Table 2 (continued)

Variable	Study 1		Study 2									
	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
18. Openness	3.79	0.71	.03	.04	-.11	-.16*	.11	.01	.06	.18**	.02	.06
19. Job satisfaction	3.42	1.10	.51**	.25**	-.52**	-.33**	.53**	.43**	.48**	.37**	.60**	.05
20. Turnover intentions	3.42	1.19	-.35**	-.13*	.36**	.25**	-.31**	-.34**	-.33**	-.27**	-.42**	-.11
21. Work engagement	4.10	1.19	.40**	.20**	-.41**	-.28**	.40**	.35**	.36**	.36**	.52**	.16*
22. WIF	2.92	0.99	-.50**	-.26**	.45**	.42**	-.32**	-.29**	-.42**	-.41**	-.33**	-.11
23. FIW	2.47	0.87	-.16*	-.04	.21**	.28**	-.08	-.08	-.16*	-.30**	-.10	-.05
24. Tension	2.05	0.68	-.14*	-.06	.14*	.10	-.09	.01	-.11	-.11	-.11	-.16*
25. Anxiety	1.63	0.71	-.16*	-.11	.19**	.18**	-.11	-.01	-.16*	-.13*	-.01	-.17**
26. Health maintenance behaviors			3.44									
27. Sleep hours			6.16									
28. Sleep quality			2.83									
29. Absenteeism			0.89									
30. Presenteeism			2.59									
31. Family dinner			2.61									
32. Parent-child activities			3.21									
33. Parent overload			2.36									
34. Convenience food consumption			2.09									

Table 2 (continued)

Variable	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Flextime availability	-.01	.12	-.07	-.03					.46**	-.42**	.31**	-.37**	-.14	-.20**
2. Flextime use	.04	.15*	-.02	-.10					.38**	-.29**	.25**	-.20**	.05	-.18*
3. Flextime interpersonal cons	.02	-.08	.02	-.09					-.44**	.33**	-.33**	.37**	.18*	.20*
4. Flextime scheduling cons	.18*	.01	-.07	-.12					-.23**	.21**	-.14	.34**	.33**	.22**
5. Schedule control (Beutell)	.09	.07	.09	-.14					.37**	-.31**	.21**	-.25**	.01	-.15*
6. Schedule control (Thomas)	.04	.11	.08	-.14					.42**	-.33**	.22**	-.27**	-.03	-.14
7. Schedule control (Swanberg)	-.15*	.09	.05	.04					.50**	-.43**	.35**	-.38**	-.21**	-.28**
8. FSOP	-.08	.03	.02	-.04					.36**	-.27**	.26**	-.50**	-.36**	-.33**
9. FSSB	-.11	.23**	-.02	.09					.54**	-.50**	.44**	-.27**	-.10	-.23**
10. Age														
11. Gender		-.16*	-.30*	-.26**					-.07	.14	-.14*	-.01	.13	-.09
12. Education	-.02	.11	.11	-.03					.25**	-.24**	.31**	.02	.13	-.17*
13. Tenure (in years)	-.07	.17*	.13	.13					.14	-.13	.14*	.03	-.06	-.11
14. Work hours per week	-.17**	.08	.18*						.08	-.01	.11	.14*	-.16*	-.01
15. Extraversion	.03	.07	.03	.11										
16. Agreeableness	.07	.06	.00	-.07	.36**									
17. Conscientiousness	-.04	.07	-.00	-.09	.00	.21**								
18. Openness	-.19**	-.01	.18*	.05	.25**	.27**	.19**							
19. Job satisfaction	-.07	-.06	-.15*	-.05	.16*	.16**	.02	.07		-.72**	.67**	-.37**	-.18*	-.45**

Table 2 (continued)

Variable	11	12	13	14	15	16	17	18	19	20	21	22	23	24
20. Turnover intentions	.05	.13*	.04	.07	-.08	-.10	.10	-.05	-.69**		-.52**	.39**	.17*	.44**
21. Work engagement	-.05	.02	-.05	-.01	.15*	.19**	.21**	.13*	.66**	-.46**		-.23**	-.11	-.31**
22. WIF	.06	-.07	-.04	.21**	-.06	-.06	-.16*	-.12*	-.41**	.35**	-.31**		.62**	.58**
23. FIW	.09	.06	-.17*	.08	-.08	-.16**	-.08	-.27**	-.20**	.15*	-.18**	.53**		.45**
24. Tension	.09	-.13*	-.06	.04	-.13*	.00	-.20**	-.10	-.18**	.07	-.13*	.40**	.26**	
25. Anxiety	.06	-.07	-.17*	.01	-.14*	-.08	-.20**	-.13*	-.04	-.04	-.09	.27**	.20**	.58**
26. Health maintenance behaviors														
27. Sleep hours														
28. Sleep quality														
29. Absenteeism														
30. Presenteeism														
31. Family dinner														
32. Parent-child activities														
33. Parent overload														
34. Convenience food consumption														

Table 2 (continued)

Variable	25	26	27	28	29	30	31	32	33	34
1. Flexitime avail-ability	-.01	.23**	.18*	.23**	.06	-.28**	.15*	.15*	-.18*	-.04
2. Flexitime use	.00	.25**	.12	.27**	.12	-.12	.16*	.17*	-.16*	-.00
3. Flexitime inter-personal cons	-.07	-.26**	-.22**	-.14*	.05	.30**	-.12	-.03	.25**	.07
4. Flexitime scheduling cons	.22**	-.02	-.15*	-.07	.20**	.32**	.12	.17*	.37**	.20**
5. Schedule control (Beutell)	.03	.10	-.00	.15*	.14*	-.14	.23**	.22**	-.07	.12
6. Schedule control (Thomas)	.03	.16*	.04	.18*	.12	-.15*	.23**	.22**	-.16*	.14
7. Schedule control (Swanberg)	-.12	.22**	.14	.23**	-.08	-.28**	.20*	.12	-.26**	-.10
8. FSOP	.23**	.22**	.20**	.14*	-.16*	-.29*	-.02	-.13	-.47**	-.19*
9. FSSB	-.11	.35**	.24**	.32**	.03	-.24**	-.02	.09	-.24**	.01
10. Age										
11. Gender	.14*	-.07	.01	-.04	.09	.07	-.07	-.02	.03	.03
12. Education	-.11	.26**	.23**	.38**	.16*	.04	.07	.16*	.03	.09
13. Tenure (in years)	-.14*	.09	-.01	.05	-.09	-.03	-.09	-.11	-.08	.05
14. Work hours per week	-.08	.03	-.12	-.09	-.06	-.07	.02	-.14*	-.02	.03
15. Extraversion										
16. Agreeableness										
17. Conscientiousness										
18. Openness										

Table 2 (continued)

Variable	25	26	27	28	29	30	31	32	33	34
19. Job satisfaction	-.22**	.35**	.20*	.42**	-.11	-.28**	.10	.12	-.25**	-.04
20. Turnover intentions	.26**	-.38**	-.21**	-.38**	.14	.32**	-.11	-.07	.22**	.04
21. Work engagement	-.18*	.36**	.17*	.33**	-.13	-.19*	.12	.10	-.16*	-.02
22. WIF	.37**	-.35**	-.24**	-.30**	.12	.36**	-.01	-.02	.57**	.31**
23. FIW	.32**	-.18*	-.21**	-.15*	.29**	.31**	.05	.06	.42**	.29**
24. Tension	.68**	-.45**	-.26**	-.52**	.15*	.41**	-.11	.05	.55**	.28**
25. Anxiety	-.35**	-.35**	-.14*	-.28**	.30**	.41**	.05	.16*	.42**	.33**
26. Health maintenance behaviors	.23**	.38**	.23**	.38**	-.04	-.29**	.12	.16*	-.28**	.00
27. Sleep hours				.44**	-.08	-.16*	-.00	.10	-.21**	.14*
28. Sleep quality					.05	-.17*	-.07	.16*	-.22**	.00
29. Absenteeism						.13	-.03	.16*	.19*	.25**
30. Presenteeism							-.06	.11	.35**	.20*
31. Family dinner								.32**	-.01	.13
32. Parent-child activities									.16*	.22**
33. Parent overload										.41**
34. Convenience food consumption										

Note. \* $p < .05$  \*\* $p < .01$  Study 1 correlations below the diagonal. Study 2 correlations above the diagonal. Gender 1 = Male, 2 = Female. Education 3 = GED, 4 = Associate's degree, 5 = Bachelor's degree. Cons = Consequences

**Table 3** Bivariate correlations between the Shift Flextime Scales (SFS) and convergent, discriminant, and correlate constructs

	Flextime availability		Flextime use		Interpersonal consequences		Scheduling consequences	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
<i>Convergent variables</i>								
Schedule control- Beutell (2010)	<b>.58*</b>	<b>.46*</b>	<b>.46*</b>	<b>.43*</b>	–.53 <sup>a</sup>	–.28*	–.35 <sup>a</sup>	.01
Schedule control- Thomas d Ganster (1995)	<b>.45*</b>	<b>.48*</b>	<b>.35*</b>	<b>.46*</b>	–.43*	–.29*	–.25*	–.04
Schedule control- Swanberg et al. (2011)	<b>.68*</b>	<b>.67*</b>	<b>.49*</b>	<b>.50*</b>	–.67*	–.61*	–.41*	–.40*
Family supportive organizational perceptions (FSOP)	<b>.36*</b>	<b>.38*</b>	<b>.18*</b>	<b>.22*</b>	–.40*	–.50*	–.54*	–.56*
Family supportive supervisor behaviors (FSSB)	<b>.52<sup>a</sup></b>	<b>.51*</b>	<b>.33*</b>	<b>.28*</b>	–.58*	–.41*	–.43*	–.26*
<i>Discriminant variables</i>								
Age	<b>.12*</b>		.02		–.06		–.11	
Gender	–.04	–.01	–.08	.04	.10	.02	<b>.18*</b>	<b>.18*</b>
Education	–.00	.12	–.05	<b>.15*</b>	.06	–.08	.03	.01
Work hours	–.09	–.07	–.13	–.08	.04	.02	–.12	–.07
Job tenure	–.07	.03	–.04	.01	.10	–.09	–.02	–.12
Extraversion	.06		.02		–.11		–.02	
Agreeableness	<b>.13*</b>		.05		–.16*		–.11	
Conscientiousness	.09		<b>.13*</b>		–.16*		–.00	
Openness to new experience	.03		.04		–.11		–.16*	
<i>Study 1 correlates</i>								
Job satisfaction	<b>.51*</b>	<b>.46*</b>	<b>.25*</b>	<b>.38*</b>	–.52*	–.44*	–.33*	–.23*
Turnover intentions	–.35*	–.42*	–.13*	–.29*	<b>.36*</b>	<b>.33*</b>	<b>.25*</b>	<b>.21*</b>
Engagement	<b>.40*</b>	<b>.31*</b>	<b>.20*</b>	<b>.25*</b>	–.41*	–.33*	–.28*	–.14
Work interference with family (WIF)	–.50*	–.37*	–.26*	–.20*	<b>.45*</b>	–.37*	<b>.42*</b>	<b>.34*</b>
Family interference with work (FIW)	–.16*	–.14	–.04	.05	<b>.21*</b>	<b>.18*</b>	<b>.28*</b>	<b>.33*</b>
Tension	–.14*	–.20*	–.06	–.18*	<b>.14*</b>	<b>.20*</b>	.10	<b>.22*</b>
Anxiety	–.16*	–.01	–.11	.00	<b>.19*</b>	.07	<b>.18*</b>	<b>.22*</b>
<i>Study 2 health correlates</i>								
Health maintenance behaviors		<b>.23*</b>		<b>.25*</b>		–.26*		–.02
Sleep hours		<b>.18*</b>		.12		–.22*		–.15*
Sleep quality		<b>.23*</b>		<b>.27*</b>		–.14*		–.07
Absenteeism		.06		.12		.05		<b>.20*</b>
Presenteeism		–.28*		–.12		<b>.30*</b>		<b>.32*</b>
<i>Study 2 parenting correlates</i>								
Family dinner		<b>.15*</b>		<b>.16*</b>		–.12		.12
Parent–child activities		<b>.15*</b>		<b>.17*</b>		–.03		<b>.17*</b>
Parent overload		–.18*		–.16*		<b>.25*</b>		<b>.37*</b>
Convenience food consumption		–.04		–.00		.07		<b>.20*</b>

FSSB, family supportive supervisor behaviors; FSOP, family supportive organizational perceptions

Significant correlations bolded for ease of interpretation. Correlations for Study 1 are cross-sectional ( $N=293$ ). Correlations for Study 2 are lagged over 1 month ( $N=199$ )

\*  $p < .05$

<sup>a</sup>Independent-samples Fisher  $r$ -to- $z$  comparisons show the correlation is stronger than the alternative study (Bonferroni-adjusted  $p < .012$ )

form of validity evidence indicates the SFS items are valid indicators of their underlying constructs. Moreover, flextime availability, interpersonal consequences, and scheduling consequences explain variance in work attitude, work-family

conflict, and psychological health correlates above and beyond similar schedule control and support measures. Finally, flex-time availability and consequences are relatively more important for predicting correlates in comparison to flextime use.

**Table 4** Summary of Study 1 incremental variance analyses

Covariates	SFS facet		Job satisfaction		Turnover intentions		Work engagement		WIF		FIW		Tension		Anxiety	
	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$
Schedule control variables	<b>12.0*</b>	<b>.03</b>	<b>6.9*</b>	<b>.02</b>	<b>7.0*</b>	<b>.02</b>	<b>27.7*</b>	<b>.07</b>	1.8	.01	2.6	.01	1.8	.01	1.7	.00
Schedule control variables	1.8	.00	2.0	.01	0.5	.00	0.6	.00	0.4	.00	0.0	.00	0.4	.00	0.3	.00
Schedule control variables	<b>19.2*</b>	<b>.04</b>	<b>8.6*</b>	<b>.02</b>	<b>10.7*</b>	<b>.03</b>	<b>17.4*</b>	<b>.05</b>	<b>6.8*</b>	<b>.02</b>	2.2	.01	<b>3.5*</b>	<b>.01</b>	<b>3.5*</b>	<b>.01</b>
Schedule control variables	<b>4.3*</b>	<b>.01</b>	<b>4.3*</b>	<b>.01</b>	<b>4.8*</b>	<b>.01</b>	<b>25.6*</b>	<b>.07</b>	<b>18.2*</b>	<b>.06</b>	0.9	.00	<b>4.4*</b>	<b>.01</b>	<b>4.4*</b>	<b>.01</b>
FSOP and FSSB	<b>20.0*</b>	<b>.04</b>	<b>6.5*</b>	<b>.01</b>	<b>5.4*</b>	<b>.01</b>	<b>42.3*</b>	<b>.10</b>	1.4	.00	2.2	.01	<b>7.4*</b>	<b>.02</b>	<b>7.4*</b>	<b>.02</b>
FSOP and FSSB	0.9	.00	0.1	.00	0.2	.00	<b>7.8*</b>	<b>.02</b>	0.0	.00	0.1	.00	3.0	.00	3.0	.01
FSOP and FSSB	<b>15.7*</b>	<b>.03</b>	<b>4.4*</b>	<b>.01</b>	3.4	.01	<b>25.1*</b>	<b>.06</b>	<b>4.6*</b>	<b>.01</b>	1.6	.00	<b>10.9*</b>	<b>.04</b>	<b>10.9*</b>	<b>.04</b>
FSOP and FSSB	0.0	.00	0.1	.00	0.2	.00	<b>12.9*</b>	<b>.03</b>	<b>7.6*</b>	<b>.02</b>	0.2	.00	<b>6.7*</b>	<b>.02</b>	<b>6.7*</b>	<b>.02</b>

FSOP, family supportive organizational perception; FSSB, family supportive supervisor behaviors; SFS, shift work flextime scale; WIF, work interference with family; FIW, family interference with work;  $\Delta F$ , change in the  $F$  statistic when adding the SFS facet above and beyond covariates;  $\Delta R^2$ , change in variance explained when adding the SFS facet above and beyond covariates

Significant  $\Delta F$  bolded for ease of interpretation

\*  $p < .05$

Flextime availability is relatively the most important for work attitudes and WIF while scheduling consequences is relatively the most important for FIW and anxiety.

### Study 2 Method

We conducted a second study to replicate validity evidence found in Study 1, and to expand the nomological network associated with flextime in the shift work context. Specifically, we sought to understand how shift work flextime availability, use, and consequences are associated with individual health behaviors (health maintenance, absenteeism, presenteeism), as well as parenting behaviors relevant for child health and development (child eating behavior, parent–child activities). We specifically posit flextime availability and use will provide autonomy and time resources that help individuals maintain personal and family health. We also hypothesize negative interpersonal and scheduling consequences will constrain individuals’ autonomy and time, thereby reducing individual and parenting behaviors that promote health.

### Participants and Procedure

Participants were recruited through Prolific for a two-wave survey study. Although we expect the variables of interest are relatively stable over time, surveys were spaced 1 month apart. We analyze lagged associations (shift work flextime scale items at Time 1, correlates at Time 2) to methodologically control for transient confounds such as mood (Podsakoff et al., 2003). A 1-month lag was used to provide enough time to reduce effects of transient confounds, while not enough time to expect major substantive changes at work or home that might reduce correlations of interest (see for example evidence of work-family conflict stability over 1-month lags; Matthews et al., 2014; Smith et al., 2022). Individuals resided in the USA or Canada, worked at least 20 h per week, had a child living at home, and worked in a shift work position with night and/or rotating shifts. In addition to meeting the eligibility criteria, participants had to correctly respond to two bogus items (e.g., “Please respond ‘Strongly Agree’ to this item.”) at each time point to ensure quality control (11 participants removed). A total of 299 participants were eligible and passed quality controls at Time 1, and 199 participants completed and passed quality controls at Time 2. The final sample with both waves ( $N = 199$ ) was predominantly female (58.29%), with 74.87% identifying as White, 12.56% identifying as Black or African American, 6.53% identifying as Asian, and 6.03% identifying as other or multiple races. Participants worked in their current organization for an average of 6.52 years, and reported an average of 39.14 work hours per week. Nineteen percent of participants ( $n = 38$ ) reported having a second job that they worked at an average of 13.32 h per week. Most participants were married or in a committed relationship (76.90%). Most (69.35%) had a higher education degree, while 30.15% had a



high school degree or GED. All measures were completed via an online survey that took approximately 20 min to complete. Participants were paid \$5 for each survey.

## Measures

See Table 1 for variable citations, number of observations, anchors, and Cronbach's alpha values.

## Results

### Study 1 Replication

To confirm the factor structure, we conducted multiple confirmatory factor analyses (CFA; ML estimation) using the lavaan package in R with the final 19 flextime items. For this analysis, we used only data from Time 1 ( $N=299$ ) to maximize sample size; results with the two-wave sample ( $N=199$ ) reached the same conclusions. The four-factor model with covaried factors demonstrated adequate fit ( $\chi^2(146)=301.91$ , CFI=0.95, RMSEA=0.06, SRMR=0.07). All of the factor loadings were statistically significant ( $p<0.01$ ) and standardized loadings ranged from 0.43 to 0.88.

We also collected the correlates from Study 1 in our Study 2 surveys in order to replicate the correlation patterns found in Study 1 (see Tables 2 and 3). We compared correlations across independent samples using a Fisher's  $r$ -to- $z$  transformation with a Bonferroni-corrected significance level ( $p<0.012$ , four comparisons per correlate; Table 3). Only two correlations were weaker in Study 2 compared to Study 1. In sum, our results indicated that correlations are comparable across samples, replicating validation evidence from Study 1 using a non-student sample. The comparability of estimates also suggests validity coefficients are relatively stable when examining cross-sectional and lagged correlations in two different samples. Finally, we also examined test-retest correlations and found SFS subscale scores were relatively stable over time (availability Time 1 and Time 2  $r=0.72$ , use Time 1 and Time 2  $r=0.65$ , interpersonal consequences Time 1 and Time 2  $r=0.71$ , scheduling consequences Time 1 and Time 2  $r=0.74$ ).

We also ran the same incremental variance analyses in Study 1 to identify whether patterns replicated. To keep the correlations comparable across studies in terms of design and power, we used only data from the first time point (Study 2  $N=299$ , cross-sectional design). Full results can be found on our OSF page (Study 2 html output). Although most conclusions were replicated, some differences emerged with the overall pattern suggesting stronger evidence for incremental prediction. Overall, Study 2 incremental variance analyses reach a similar conclusion: flextime availability, interpersonal consequences, and scheduling consequences explain variance in work attitude, work-family conflict, and psychological health correlates above and beyond other control measures and measures of work support. In Study 2,

flextime use also shows a bit more incremental validity evidence, particularly beyond other work-family support variables.

## Relationships with Individual Health Maintenance Correlates

Next, we examined relationships between each of the four shift work flextime facets at Time 1 and individual health correlates (Hypotheses 5–8 h–l), as well as parenting behaviors (Hypotheses 5–8 m–p) at Time 2. Correlations are in Tables 2 and 3. We first discuss individual health correlates. Regarding health maintenance (Hypotheses 5–8 h), flextime availability ( $r=0.23$ ,  $p<0.01$ ) and use ( $r=0.25$ ,  $p<0.01$ ) were associated with more health maintenance, whereas interpersonal consequences ( $r=-0.26$ ,  $p=0.01$ ) was associated with less health maintenance. Scheduling consequences was not associated with health maintenance behaviors ( $r=-0.02$ ,  $p=0.73$ ). Regarding sleep hours (Hypotheses 5–8i), flex-time availability was associated with more hours ( $r=0.18$ ,  $p=0.01$ ), whereas interpersonal consequences ( $r=-0.22$ ,  $p<0.01$ ) and scheduling consequences were associated with fewer hours ( $r=-0.15$ ,  $p=0.03$ ). Flextime use was not associated with sleep hours ( $r=0.12$ ,  $p=0.08$ ). Regarding sleep quality (Hypotheses 5–8j), flextime availability ( $r=0.23$ ,  $p<0.01$ ) and use ( $r=0.27$ ,  $p<0.01$ ) were associated with better quality sleep, whereas interpersonal consequences was associated with worse sleep quality ( $r=-0.14$ ,  $p=0.047$ ), and scheduling consequences was not associated with sleep quality ( $r=-0.07$ ,  $p=0.32$ ). Regarding absenteeism (Hypotheses 5–8 k), scheduling consequences was associated with increased absenteeism ( $r=0.20$ ,  $p<0.01$ ), and flextime availability, use, and interpersonal consequences were not associated with absenteeism ( $p>0.05$ ).<sup>4</sup> Finally regarding presenteeism (Hypotheses 5–8 l), flextime availability was associated with reduced presenteeism ( $r=-0.28$ ,  $p<0.01$ ), and interpersonal consequences ( $r=0.30$ ,  $p<0.01$ ) and scheduling consequences ( $r=0.32$ ,  $p<0.01$ ) were associated with increased presenteeism. Flextime use was not associated with presenteeism ( $r=-0.12$ ,  $p=0.08$ ).

In sum with regard to individual health correlates, flex-time availability was associated with all health correlates as expected except absenteeism (Hypothesis 5 mostly supported, Hypothesis 5 k not supported). Flextime use was associated

<sup>4</sup> We also post hoc explored whether shift work flextime factors were associated with the number of times individuals did not find someone to cover a shift in the event when absent from work. Interpersonal ( $r=.15$ ,  $p=4.04$ ) and scheduling consequences ( $r=.24$ ,  $p<.01$ ) were associated with inability to find coverage, consistent with our a priori rationale. Flextime availability and use were not associated with being able to find coverage ( $p>.37$ ).

with health maintenance behavior and sleep quality, but not sleep hours, absenteeism, or presenteeism (Hypotheses 6 h and 6j supported and Hypothesis 6i–l not supported). Flex-time interpersonal consequences was associated with all health correlates as expected (Hypothesis 7 fully supported). Flextime scheduling consequences was associated with sleep hours and presenteeism, but not health maintenance behavior, sleep quality, or absenteeism (Hypotheses 8i and 8l supported and Hypotheses 8 h, 8j, and 8 k not supported).

### Relationships with Parenting Correlates

Finally, we examined correlations with parenting behaviors to examine the extent that flextime enables parenting behaviors that promote health and well-being for children. Regarding family dinner (Hypotheses 5–8 m), flextime availability ( $r=0.15$ ,  $p=0.04$ ) and use ( $r=0.16$ ,  $p=0.02$ ) were associated with more frequent family dinners, but interpersonal and scheduling consequences were not associated with family dinner frequency ( $p>0.08$ ). Regarding parent–child activities (Hypotheses 5–8n), flextime availability ( $r=0.15$ ,  $p=0.04$ ), use ( $r=0.17$ ,  $p=0.02$ ), and scheduling consequences ( $r=0.17$ ,  $p=0.02$ ) were associated with more frequent activities, whereas interpersonal consequences was not associated with parent–child activities ( $r= -0.03$ ,  $p=0.72$ ). Regarding parental overload (Hypotheses 5–8o), flextime availability ( $r= -0.18$ ,  $p<0.01$ ) and use ( $r= -0.16$ ,  $p=0.03$ ) were associated with reduced overload, whereas interpersonal ( $r=0.25$ ,  $p<0.01$ ) and scheduling consequences ( $r=0.37$ ,  $p<0.01$ ) were associated with increased overload. Lastly regarding convenience foods (Hypotheses 5–8p), scheduling consequences was associated with increased child consumption of convenience foods ( $r=0.20$ ,  $p<0.01$ ), but flextime availability, use, and interpersonal consequences were not associated with convenience food consumption ( $p>0.32$ ).

In sum with regard to parenting correlates, flextime availability and use were associated with all parenting correlates as expected except child consumption of convenience foods (Hypotheses 5 and 6 mostly supported, Hypotheses 5p and 6p not supported). Flextime scheduling and interpersonal consequences were both only associated with parental overload as predicted (Hypotheses 7 and 8 mostly not supported, Hypotheses 7 and 8 m, n, and p not supported). Flextime scheduling was significantly associated with parent–child activities, but in the opposite of the hypothesized direction.

### Incremental Variance Explained

Similar to Study 1, we investigated the extent to which the SFS facets explained variance in Study 2 health and parenting correlates above and beyond other schedule control measures (see Table 5). Looking at analyses controlling for schedule control, flextime availability explained additional

**Table 5** Summary of Study 2 incremental variance analyses for health and parenting correlates

Covariates	SFS facet		Health maintenance behaviors		Sleep hours		Sleep quality		Presenteeism		Absenteeism		Family dinner		Parent–child activities		Parent overload		Convenience food consumption		
	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	$\Delta F$	$\Delta R^2$	
Schedule control variables			<b>9.7*</b>	<b>.03</b>	3.8	0.6	0.1	.00	<b>9.9*</b>	<b>.03</b>	<b>9.9*</b>	<b>.03</b>	<b>.03</b>	<b>.03</b>	0.7	.00	0.1	.00	1.0	.00	
Schedule control variables			<b>18.1*</b>	<b>.06</b>	<b>8.5*</b>	1.9	.01	1.2	.00	0.5	.00	0.5	.00	0.1	.00	0.1	.00	1.2	.00	2.1	.01
Schedule control variables			<b>5.8*</b>	<b>.02</b>	<b>5.0*</b>	3.2	.01	1.1	.00	<b>20.0*</b>	<b>.06</b>	<b>20.0*</b>	<b>.06</b>	<b>.06</b>	<b>3.8</b>	<b>.01</b>	1.1	.00	0.2	.00	
Schedule control variables			0.4	.00	2.8	<b>9.9*</b>	<b>.03</b>	1.3	.00	<b>34.9*</b>	<b>.10</b>	<b>34.9*</b>	<b>.10</b>	<b>.10</b>	<b>5.8*</b>	<b>.02</b>	1.3	.00	<b>11.0*</b>	<b>.03</b>	
FSOP and FSSB			2.3	.01	2.3	1.3	.00	2.6	.01	1.2	.00	1.2	.00	0.1	.00	0.1	.00	2.6	.01	<b>4.6*</b>	<b>.01</b>
FSOP and FSSB			<b>13.5*</b>	<b>.04</b>	<b>11.2*</b>	0.0	.00	<b>4.8*</b>	<b>.02</b>	0.1	.00	0.1	.00	0.0	.00	0.0	.00	<b>4.8*</b>	<b>.02</b>	<b>6.0*</b>	<b>.02</b>
FSOP and FSSB			3.5	.01	3.3	<b>5.0*</b>	<b>.02</b>	0.3	.00	<b>4.2*</b>	<b>.01</b>	<b>4.2*</b>	<b>.01</b>	<b>.01</b>	2.3	.00	0.3	.00	0.3	.00	
FSOP and FSSB			1.1	.00	0.7	<b>8.8*</b>	<b>.03</b>	0.5	.00	<b>12.0*</b>	<b>.03</b>	<b>12.0*</b>	<b>.03</b>	<b>.03</b>	<b>4.5*</b>	<b>.01</b>	0.5	.00	<b>10.9*</b>	<b>.03</b>	

FSOP, family supportive organizational perception; FSSB, family supportive supervisor behaviors; SFS, shift work flextime scale; W/F, work interference with family; F/W, family interference with work;  $\Delta F$ , change in the  $F$  statistic when adding the SFS facet above and beyond covariates;  $\Delta R^2$ , change in variance explained when adding the SFS facet above and beyond covariates

Significant  $\Delta F$  bolded for ease of interpretation

\*  $p < .05$

variance in health maintenance behaviors, sleep quality, and parent overload. Flextime use predicted additional variance in absenteeism, health maintenance behaviors, sleep hours, and sleep quality. Interpersonal consequences explained additional variance in health maintenance behaviors, sleep hours, and parent overload. Finally, scheduling consequences explained additional variance in presenteeism, absenteeism, and all parenting correlates except family dinner.

Looking at analyses controlling for work-family support (FSOP and FSSB), flextime availability only explained additional variance in parent-child activities. Flextime use explained additional variance in the same correlates (absenteeism, health maintenance behaviors, sleep hours, sleep quality) as well as family dinner and parent-child activities. Interpersonal consequences only explained additional variance in presenteeism and parent overload. Finally, scheduling consequences explained additional variance in the same correlates as when controlling for schedule control (presenteeism, absenteeism, all parenting correlates except family dinner).

Again, we can conclude SFS subscales show predictive validity above and beyond other schedule control measures and family supportive measures. In particular, flextime use appears to be especially unique for predicting health maintenance behaviors for the self and the family (absenteeism, health maintenance, sleep, family dinner, parent-child activities). Additionally, scheduling consequences and to a lesser extent interpersonal consequences are unique predictors of presenteeism and parent overload. Scheduling consequences was also a unique predictor of absenteeism, child convenience food consumption, and parent-child activities.

### Relative Importance

We again explored relative importance of the SFS subscales using dominance analysis. Results are shown in Table 6. Replicating Study 1, we found availability was more important than use for explaining variance in job attitudes, WIF, FIW, and anxiety among shift workers. For tension, standardized dominance estimates were similar (19% for flextime

**Table 6** Dominance analysis results for Study 1 and Study 2

	Flextime availability				Flextime use				Interpersonal consequences				Scheduling consequences				Total R <sup>2</sup>	
	General Dominance		Std Dominance		General Dominance		Std Dominance		General Dominance		Std Dominance		General Dominance		Std Dominance		S1	S2
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2				
<i>Study 1 correlates</i>																		
Job satisfaction	.13	.09	.40	.37	.02	.06	.07	.23	.14	.08	.43	.32	.03	.02	.11	.08	.32	.25
Turnover intentions	.07	.09	.40	.50	.01	.03	.07	.19	.06	.04	.39	.21	.02	.02	.14	.10	.17	.19
Engagement	.07	.04	.38	.31	.01	.03	.07	.20	.08	.05	.41	.44	.03	.01	.14	.05	.20	.13
Work interference with family (WIF)	.12	.07	.39	.33	.02	.01	.07	.07	.08	.06	.27	.28	.08	.06	.26	.32	.30	.20
Family interference with work (FIW)	.01	.01	.10	.10	.00	.01	.04	.10	.02	.01	.25	.11	.05	.08	.61	.69	.09	.12
Tension	.01	.01	.44	.19	.00	.02	.07	.22	.01	.01	.36	.16	.00	.03	.14	.43	.03	.08
Anxiety	.01	.00	.21	.05	.00	.00	.07	.02	.02	.00	.35	.06	.02	.05	.37	.87	.05	.05
<i>Study 2 health correlates</i>																		
Presenteeism			.04	.27			.01	.04			.04	.26			.06	.43	.14	
Absenteeism			.01	.12			.01	.18			.01	.08			.04	.62	.07	
Health maintenance behaviors			.02	.21			.03	.32			.04	.42			.01	.05	.10	
Sleep hours			.01	.24			.01	.10			.03	.47			.01	.19	.05	
Sleep quality			.02	.31			.05	.57			.01	.09			.00	.03	.08	
<i>Study 2 parenting correlates</i>																		
Parent overload			.01	.06			.02	.10			.03	.16			.11	.68	.16	
Convenience food consumption			.00	.02			.00	.01			.00	.07			.04	.91	.04	
Family dinner			.01	.18			.01	.17			.01	.21			.03	.44	.07	
Parent-child activities			.02	.27			.02	.20			.00	.05			.04	.48	.08	

*General Dominance*, general dominance weight as a raw amount of variance explained in the correlate (within rounding error raw weights will sum to R<sup>2</sup>); *Std Dominance*, standardized dominance rescaled as a percentage of predicted variance in the criterion variable attributed to each predictor (within rounding error rescaled weights sum to 100%); S1, Study 1; S2, Study 2

Relative weights for Study 1 are cross-sectional (N=293). Relative weights for Study 2 are lagged over 1 month (N=199). Significant correlations bolded for ease of interpretation

availability compared to 22% for flextime use). Regarding health correlates, we found a similar contrast for presenteeism and sleep hours, suggesting availability is more important than use for these health correlates as well. However, sleep quality, health maintenance behaviors, and to a lesser extent absenteeism had the opposite trend, such that flex-time use (18–57% of explained variance) was ranked higher than flextime availability (12–31% of explained variance). Regarding parenting correlates, flextime availability (2–27% of explained variance) and use (1–20% of explained variance) had similarly sized (small) weights. Similar to Study 1, we also saw trends that suggest scheduling and interpersonal consequences are particularly important for health and non-work correlates. Scheduling consequences was the top ranked predictor for FIW, tension, anxiety, presenteeism, absenteeism, and all parenting correlates (43–91% of explained variance) and the second ranked predictor for WIF (32% of explained variance). As exceptions, scheduling consequences explained relatively little variance in health maintenance behavior (5%), sleep hours (19%), and sleep quality (3%). Interpersonal consequences was often second- or third-ranked across all correlates, accounting for a non-negligible portion of explained variance (21% on average), in line with findings from Study 1.

## Study 2 Conclusion

Overall, Study 2 replicates conclusions from Study 1 in showing that SFS subscales adhere to the a priori psychometric structure, are distinct from similar support measures, and are associated with correlates as expected. Furthermore, all four SFS subscales explain variance in health and parenting correlates above and beyond other schedule control and work-family support measures. Finally, dominance analyses show flextime availability and consequences are relatively more important for predicting job attitude and work-family correlates in comparison to flextime use. Flextime use did, however, explain relatively more variance than availability in health maintenance behaviors and sleep. Similar to Study 1, scheduling consequences is relatively most important for non-work correlates, including parenting, followed by interpersonal consequences.

## Discussion

In order to better understand flexibility as it is enacted in shift work (Lambert et al., 2012), we developed a measure of flextime availability, use, interpersonal, and scheduling consequences, with the aim of better understanding the implications of flextime for the large portion of the workforce with non-traditional schedules. Across three phases

and two independent samples, we developed concise measures for all four aspects of flextime, with support for content, convergent, discriminant, and criterion-related validity. Consistent with the broader flexibility literature, we found flextime availability and, to a lesser extent, use are associated with increased job attitudes, health and well-being, and parenting behavior among shift workers. Our measures of shift flextime availability, interpersonal consequences, and scheduling consequences also predicted work-, health and well-being-, and family-related correlates above and beyond other measures of schedule control, family supportive supervision, and perceptions of work support. We also found evidence for discriminant validity, as flextime availability, use, and consequences were not associated with personality or demographic factors.<sup>5</sup> Finally, dominance analyses across the two study samples showed flextime availability is a more powerful predictor of work attitudes and WIF than flextime use, flextime use was a relatively more powerful predictor of individual health maintenance behaviors and sleep, and scheduling consequences (and to a lesser extent interpersonal consequences) was particularly important and a unique predictor of nonwork and parenting correlates.

## Theoretical Implications

Our study supports the growing chorus of scholars contending that the work-family interface (Agars & French, 2011, 2016; French & Agars, 2018; Grzywacz et al., 2008) and flexibility (Henly & Lambert, 2014; Henly et al., 2006; Lambert et al., 2012) meaningfully differ for those with non-standard work arrangements. We expand on these critiques by creating a validated measure to capture flextime as it is enacted within shift work. We also expand the nomological network of flextime to correlates pertinent to worker health (absenteeism, presenteeism, health maintenance) and parenting (parenting overload, child consumption of convenience foods, family dinner, parent-child activities) that receive rare attention. A well-validated measurement is a critical first step for generating empirical work that develops solutions for worker health and happiness beyond traditional working populations. Further underscoring the importance of our study is the fact that shift workers are an under-researched and vulnerable working arrangement associated with racial, socio-economic, and health disparities (Goh et al., 2016; Leupp et al., 2021; Semyonov et al., 2011). Improving

<sup>5</sup> Independent-samples *t*-tests show no evidence that levels of SFS scales, WIF, or FIW differ for those working daytime shifts compared to other shifts, nor for workers with one job compared to workers with two jobs ( $p > .05$ ). In Study 1, full-time workers reported greater interpersonal consequences and WIF compared to part-time workers, and in Study 2, part-time workers reported greater scheduling consequences and FIW compared to full-time workers.

flexitime for shift workers may be one way to address these disparities (Schneider & Harknett, 2019a).

We further expanded our conceptualization of flexitime in the shift work literature by deriving and creating measures of two distinct consequences that are particularly relevant to shift workers: interpersonal and scheduling consequences. Each form of consequence is distinct and associated with critical work, health, and parenting outcomes. By developing measures for these two facets of flexitime use consequences, we bring explicit attention to the fact that employees' decision to use shift flexitime may result in complex negative outcomes that reflect the organization's broader norms and attitudes regarding the balance of work and family. Assessing barriers to flexibility is increasingly recognized as a critical aspect of supporting workers' autonomy and control (French & Shockley, 2020; Perrigino et al., 2018). These scales have the potential to yield insight into when and for whom flexitime is possible and effective within shift work contexts.

Our correlations suggest an interesting pattern with potential for inductive theoretical insight. Work attitudes appear to be more weakly associated with flexitime use compared to flexitime availability. Flexitime use also explains relatively little incremental variance above and beyond convergent variables. Dominance analyses similarly show flexitime use explains relatively minimal variance in job attitudes (availability accounted for 11–33% more variance explained than use) and perceptions and behaviors that prioritize work over family such as WIF and presenteeism (availability accounted for 23–32% more variance explained than use). These weaker associations with flexitime use compared to availability are consistent with the broader flexibility literature (Allen et al., 2013). Overall, these trends suggest availability is more important than use for psychologically reflecting on work and its impact on family.

In contrast, correlates that involve personal health (health maintenance, sleep quality, absenteeism) and parenting (parent–child activities, convenience food consumption, family dinner) tend to be similarly associated with both flexitime availability and flexitime use. Furthermore, flexitime use explains incremental variance in these outcomes, and flexitime use is a dominant predictor of both sleep quality and presenteeism. Perhaps for work-related attitudes and perceptions, merely having flexitime available and a supportive interpersonal context are enough to make people feel satisfied and supported. However, when it comes to enacting nonwork and social responsibilities such as getting a good night's sleep, maintaining personal health, and parenting, use and scheduling consequences become more important than having resources available. This is a notable contribution, given that it is generally accepted that availability is more beneficial than actual flexitime use, and that supportive work contexts are critical for understanding how employers

support the work-family interface (French & Shockley, 2020). Our results suggest personal health and the social demands of parenting are important boundary conditions for these conclusions, and that use matters when looking at outcomes beyond worker attitudes.

Finally, scheduling consequences clearly drive variance explained for parenting correlates, emphasizing the importance of structural work hour decisions for parenting behavior. Although the magnitudes of correlations between flexitime availability and use were comparable to scheduling consequences, dominance analyses and incremental variance analyses clearly point to scheduling consequences as the most unique and dominant predictor. For example, in Study 1 and Study 2, scheduling consequences is the top-ranked predictor for FIW and anxiety (accounting for 61–87% of explained variance), and in Study 2, scheduling consequences is the top-ranked predictor for tension, presenteeism, absenteeism, and all four parenting correlates (accounting for 43–91% of explained variance). Scheduling consequences also explains a substantial portion of the variance in WIF in Study 1 (ranked 3<sup>rd</sup>, 26%) and Study 2 (ranked 2<sup>nd</sup>, 32%). For these same work-family and health correlates, interpersonal consequences was most often ranked 2<sup>nd</sup> in terms of importance for variance explained (accounting for 5–36% of explained variance; although relationships are weakest for parenting correlates). Although others have suggested family supportive climates are important (Allen, 2001; French et al., 2018; Thompson et al., 1999), our measure pinpoints punishing future scheduling opportunities as a consequence specific to shift work that has unique implications. Again, our findings point away from a focus on offering flexitime policies and instead suggest that when it comes to parenting, facilitating a positive climate in which workers are not punished through scheduling changes may be most critical.

## Practical Implications

We hope the SFS will be of use to organizations and practitioners that seek to improve the quality of life for shift workers. The SFS could be used to assess and track perceptions of flexitime availability and use, as well as detect interpersonal and scheduling barriers that may ameliorate potential benefits of flexible scheduling. We show flexitime and the consequences associated with flexitime are associated with productivity and health metrics organizations care about, such as engagement, turnover, absenteeism, coverage of missed shifts (see Footnote 3), and presenteeism, as well as health and parenting outcomes critical for worker well-being. Thus, human resources managers and organizational leaders who address these consequences

might directly improve bottomline indicators of success (i.e., retention, performance), as well as the health of workers and their children.

Our findings can help inform current policy efforts to improve scheduling flexibility for shift workers (Rummler & The 19th, 2021). Indeed, scheduling flexibility has been identified as a crucial resource for retaining and protecting the well-being of workers with marginalized identities, including Black employees, Latinx employees, and women of color employees, all of whom report greater exposure to unpredictable work schedules (Schneider & Harknett, 2019a). In particular, our results underscore the importance of scheduling practices as a systemic and tangible way to help shift workers address their family needs (e.g., Henly & Lambert, 2014; Schneider & Harknett, 2019a). The findings also buttress current efforts to train supervisor supportive behaviors in shift work populations (e.g., Hammer et al., 2011) and suggest an important focus for future practice and intervention research.

### Limitations and Future Recommendations

The data across studies are cross-sectional or lagged. This choice was purposeful, as the constructs examined in our studies, and particularly those in the SFS, are likely relatively stable over time. It is possible that the associations observed here are inflated due to person-level confounds such as personality or disposition. Future research might use longitudinal and experimental designs to more clearly disentangle temporal precedence and causality.

It is possible that other forms of flexibility may increase control and support, but were not included here. For example, shift workers may engage in job crafting to idiosyncratically alter tasks, relationships, and thinking about work (Wrzesniewski & Dutton, 2001). Two of the reviewed job control measures include one crafting item each (Ala-Mursula et al., 2006; Hill et al., 2001), and job crafting has been studied in shift work populations such as police and health care professionals (Gordon et al., 2015; Petrou et al., 2015). Our measure is squarely focused on exerting flexibility and control over work time. We encourage future work to explore further possibilities to understand the ways in which shift workers exert control and autonomy.

We similarly only examine direct relationships between each SFS scale and correlates. However, in practice, relationships among the scales may be more complicated. For example, previous research suggests flexibility policies are most strongly associated with work-family experiences when enacted in contexts that facilitate use (French & Shockley, 2020). Thus, it may be that interpersonal or scheduling consequences weaken the relationship between flextime use and correlates. Alternatively, interpersonal and scheduling

consequences may act as constraints that reduce availability or use of flextime (French & Shockley, 2020) and thus indirectly predict work, family, and health correlates. These possibilities could be more thoughtfully disentangled with appropriate longitudinal and/or qualitative designs.

At first blush, the shift work flextime use measure has less sufficient evidence for its reliability and validity in comparison with the other three SFS subfacets. The relatively low Cronbach's alpha estimates are largely due to the small number of items combined with items that capture specific behaviors and cover the breadth of the construct domain (Cortina, 1993). Furthermore, flextime use had relatively small correlations, incremental variance explained, and explained the least variance in most correlates in comparison to other subfacets. However, this pattern is in line with theory that suggests flexibility use facilitates overwork and role blurring, resulting in weaker associations with correlates compared to flexibility availability (Allen et al., 2013; Schieman & Glavin, 2017; Schieman & Young, 2010). Nevertheless, we suggest that further validation evidence would be a prudent next step.

We encourage future work that expands the nomological network of our scale. In particular, it would be interesting to directly compare the nomological network of the SFS with more traditional standard-hour workers and flexibility measures. Another avenue would be continued exploration of behaviors relevant to child health (Allen et al., 2015; Davis et al., 2015; Schneider & Harknett, 2019a). It could also be possible that parenting and child demands impact flexibility (Cho & Ciancetta, 2016; Major et al., 2004). For example, those with more parenting demands might select jobs that are more flexible, be more likely to use policies, or have reduced consequences due to perceived need.

### Conclusion

Researchers have yet to fully understand work-family challenges faced by the ever-growing shift work population. In response, we developed measures of shift flextime availability, use, and scheduling and interpersonal consequences. The measures extend beyond existing broad measures of family-friendly organizations and ad hoc measures of schedule control by capturing specific behaviors and consequences associated with flextime as they are enacted in shift work contexts. It is our hope that these measures will yield a greater understanding of the ways in which organizations and individuals can harness and manage flextime for improved individual and family performance, health, and well-being.

## Declarations

**Conflict of Interest** The authors declare no competing interests.

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