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Intervention Effects on Safety Compliance and Citizenship Behaviors: Evidence From the Work, Family, and Health Study

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We tested the effects of a work–family intervention on employee reports of safety compliance and organizational citizenship behaviors in 30 health care facilities using a group-randomized trial. Based on conservation of resources theory and the work–home resources model, we hypothesized that implementing a work–family intervention aimed at increasing contextual resources via supervisor support for work and family, and employee control over work time, would lead to improved personal resources and increased employee performance on the job in the form of self-reported safety compliance and organizational citizenship behaviors. Multilevel analyses used survey data from 1,524 employees at baseline and at 6-month and 12-month postintervention follow-ups. Significant intervention effects were observed for safety compliance at the 6-month, and organizational citizenship behaviors at the 12-month, follow-ups. More specifically, results demonstrate that the intervention protected against declines in employee self-reported safety compliance and organizational citizenship behaviors compared with employees in the control facilities. The hypothesized mediators of perceptions of family-supportive supervisor behaviors, control over work time, and work–family conflict (work-to-family conflict, family-to-work conflict) were not significantly improved by the intervention. However, baseline perceptions of family-supportive supervisor behaviors, control over work time, and work–family climate were significant moderators of

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the intervention effect on the self-reported safety compliance and organizational citizenship behavior outcomes.

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Despite mounting evidence that interventions and practices that decrease workplace stress lead to improvements in both individual and organizational functioning (LaMontagne, Keegel, Louie, Ostry, & Landsbergis, 2007), very little research has examined workplace interventions and solutions designed specifically to reduce work–family conflict (see Hammer, Demsky, Kossek, & Bray, in press, for a review). National surveys continue to point to the intersection of work and nonwork life as being one of the top, if not *the* top, stressors impacting workers' lives today (e.g., American Psychological Association, 2014; Matos & Galinsky, 2014); however, proven organizational strategies aimed at improving work–life integration are rare, and research evidence is dependent on weak experimental designs or correlational relationships that can be influenced by many factors both at work and at home (Kelly et al., 2008). Furthermore, there are at least five recent meta-analyses on the effects of work–life integration policies and organizational outcomes, but these draw primarily on correlational studies offering little in the way of strong causal conclusions (e.g., Allen, Johnson, Kiburz, & Shockley, 2013; Butts, Casper, & Yang, 2013; Gajendran & Harrison, 2007; Mesmer-Magnus & Viswesvaran, 2006; Michel, Kotrba, Mitchelson, Clark, & Baltes, 2011).

In addition to most work–life integration policies and programs not being evidence-based, they also tend to be primarily available to employees in professional jobs and those employed by larger organizations (Kossek, 2005). Availability of these policies and programs is extremely limited for employees in smaller businesses and those in low-wage, hourly positions who are most in need of such supports and who have far fewer financial resources to assist with work–home management responsibilities (Hammer, Van Dyck, & Ellis, 2013). Thus, we argue that there is a need for more methodologically rigorous, evidence-based research on the effectiveness of work–family workplace interventions impacting employee *and* workplace business outcomes. Furthermore, there is a need to better understand the conditions under which such interventions are maximally effective, and a need for examination of work–family interventions among lower wage workers (Henly & Lambert, 2014).

The purpose of the present study is to examine the impact of a work–family workplace intervention, using a group-randomized control design, on two workplace performance outcomes in the health care industry (i.e., extended care nursing homes): employee reports of safety compliance and organizational citizenship behaviors (OCBs). Safety is a primary concern in health care settings because patients' lives are on the line, with disease transmission and injury related to accidents (e.g., needle sticks) being particularly notable (Clark, Zickar, & Jex, 2014). We focus on the safety compliance component of safety performance, which is most related to core safety behaviors and task performance (Griffin & Neal, 2000). Additionally, health care settings are collaborative environments that rely on teamwork to ensure beneficial patient outcomes (Kalisch, Curley, & Stefanov, 2007). Therefore, investigating employee reports of organizational citizenship, or "helping" behaviors, a central contextual aspect of job performance for health care employees, is also of fundamental importance (e.g., Clark et al., 2014). By examining outcomes from both the task and contextual domains, we include two major components of job performance as defined by Borman and Motowidlo (1993). Specifically, the goals of this study are to test the longitudinal effects of a work–family intervention on employee reports of safety compliance and OCBs, as well as to test proposed mediating mechanisms and baseline moderators to understand the conditions under which the intervention is most successful.

Study Background

The present study is based on data from the Work, Family, and Health Study (WFHS), the largest (to our knowledge) work–family intervention study to date. The WFHS was designed by an interdisciplinary team of researchers from seven institutions, and was funded by a cooperative agreement between the National Institutes of Health and the Centers for Disease Control and Prevention to develop and evaluate an intervention designed to reduce work–family conflict, leading to improved health and well-being of workers, their families, and their employing organizations. As part of the formative WFHS research, Kelly et al. (2008) proposed a multilevel, mediational model in which organizational policies and practices influence perceptions of supervisor support for work and family, perceptions of control over the timing of work, and the cultural expectations and norms about work and family. King et al. (2012) extended this model, focusing on work–family intervention targets that increased employee perceptions of supervisor support for work and family, and perceived control over work time, leading to the proximal intervention outcome of reduced work–family conflict, and, ultimately, improved work, health, and family outcomes.

The WFHS theoretical model introduced by King et al. (2012) was based on preliminary research. Pilot intervention studies conducted with grocery store workers (Hammer, Kossek, Anger, Bodner, & Zimmerman, 2011) and professional office workers (Kelly, Moen, & Tranby, 2011) demonstrated that promoting employee resources via training supervisors to increase support for employees' personal and family lives (i.e., hereafter referred to as *family supportive supervisor behaviors*; FSSBs) and increasing employee control over their work time, resulted in improvements in worker perceptions of FSSB and perceptions of control over work time, leading to increased workplace, health, and well-being outcomes.

As an extension of this earlier pilot work (Hammer et al., 2011; Kelly et al., 2011), the WFHS integrated both components (FSSB and control over work time) together as intervention targets to increase by providing supervisor training and facilitated work

redesign processes. According to the work–home resources model, these intervention targets can be referred to as *contextual resources*, as they are part of the social and environmental context outside of the self (ten Brummelhuis & Bakker, 2012). Thus, as part of the WFHS, two large-scale intervention studies were then conducted (the intervention is described in more detail in the Method section of this article, in our online supplemental appendix, and at www.WorkFamilyHealthNetwork.org), with the goal of expanding the generalizability of the intervention to both a professional-level information technology industry and an hourly, lower wage workforce in the health care industry. The intervention, in turn, was expected to increase employee perceptions of FSSB and employee perceptions of control over work time, which, theoretically, are expected to increase personal resources of time and energy, in turn leading to improvements in behavioral outcomes (ten Brummelhuis & Bakker, 2012).

To date, four studies conducted in the information technology industry document the positive effects of the WFHS intervention, referred to as STAR (Support.Transform.Achieve.Results; i.e., Davis et al., 2015; Kelly et al., 2014; McHale et al., 2015; Olson et al., 2015). Davis et al. (2015) demonstrated the effects of STAR, implemented in a group-randomized trial, on increasing reported parental time with children at 12 months postintervention. Kelly et al. (2014) found that STAR led to reduced work–family conflict and improved perceived family time adequacy, as well as increased employee perceptions of control over work time and perceived FSSB at 6 months postintervention. McHale et al. (2015) demonstrated the main effects of STAR on youth's sleep latency, night-to-night variability in sleep duration, and sleep quality, but not sleep duration at the 12-month follow-up, and Olson et al. (2015) showed that STAR led to improved reports of employee sleep quality and quantity at the 12-month follow-up. Moreover, Olson et al. found that STAR affected sleep quality through the mechanisms of perceived control over work time and work-to-family conflict at 6 months. Thus, previous research examining the effectiveness of STAR indicates that the intervention successfully operated through the theoretically derived intervention targets of perceptions of FSSB and perceived control over work time, and through proximal perceptions of work–family conflict, and had an effect on more distal outcomes (i.e., reports of time spent with children, reports of family time adequacy, and reported sleep quality and quantity) in a professional information technology industry.

We add to the research on STAR conducted in the information technology industry (Davis et al., 2015; Kelly et al., 2014; McHale et al., 2015; Olson et al., 2015) to test the effects of STAR in the health care industry on workplace outcomes. Specifically, using a group-randomized trial, we tested the longitudinal effects of STAR on employee reports of the workplace performance outcomes of safety compliance and OCBs. We also examined mediating mechanisms and moderating contextual variables as shown in Figure 1.

STAR Workplace Intervention Outcomes: Safety Compliance and OCBs

Despite the importance of these workplace performance measures, limited research exists that specifically examines workplace interventions designed to impact safety compliance or OCBs. Earlier research has linked, at the correlational level, supervisor support for safety and safety compliance (Thompson, Hilton, & Witt, 1998). We also note the research by Zohar and Luria (2003, 2005) examining a supervisor-based safety climate intervention that involved training managers to address safety within their teams through communication strategies. More recently, Zohar and Polachek (2014) focused on the modification of daily messages between supervisors and employees in a randomized intervention study demonstrating positive effects on safety communications and safety outcomes. These provide examples of interventions incorporating supervisor support and communications training that lead to improvements in safety outcomes, including safety compliance. As for interventions aimed at increasing OCBs, only a pair of studies by Skarlicki and Latham (1996, 1997), examining the impact of union leader justice-training interventions on union member OCBs, were found. Below we review theoretically derived mechanisms of STAR and expected effects on workplace outcomes.

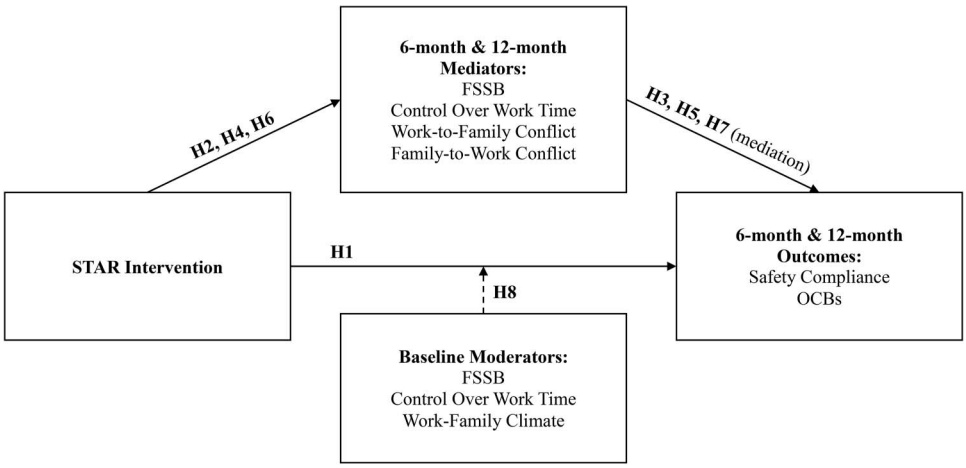

Figure 1. Theoretical model linking STAR to organizational outcomes. FSSB = family supportive supervisor behavior; OCBs = organizational citizenship behaviors; H = hypothesis.

Mechanisms Underlying Work–Family Intervention Effects

Drawing on the work–home resources model (ten Brummelhuis & Bakker, 2012), as well as prior reviews of the work–family intervention research literature (e.g., Brough & O'Driscoll, 2010; Hammer et al., in press; Kelly et al., 2008; Kelly et al., 2014; King et al., 2012), we argue that the two key intervention targets that have the strongest probability of improving workplace outcomes are increased supervisor support for work and family and increased employee control over work time (referred to as *contextual resources*; ten Brummelhuis & Bakker, 2012), with the expectations of increasing employee perceptions of FSSB and employee perceptions of control over work time (see Kelly et al., 2014; Kossek, Hammer, Kelly, & Moen, 2014). We draw on the conservation of resources (COR) theory and the work–home resources model to further make our point.

COR Theory and Work–Home Resources Model

COR theory suggests that increasing resources leads to improved outcomes, and support and control are noted as two primary resources, according to Hobfoll (1989). According to COR, strain results from a loss of resources, the threat of resource loss, or a lack of resource gain after the investment of resources. Resources can be conditions, objects, personal resources, and energies that the individual values. Social support and increased autonomy associated with increased control over work time are further delineated as contextual resources by ten Brummelhuis and Bakker (2012) in the work–home resources model. Such contextual resources are expected to impact personal resources—such as time and energy—that, in turn, lead to improvements in behavioral outcomes. STAR is aimed at increasing supervisor support for work and family and control over work time, two contextual resources, while also aimed at decreasing work–family conflict, a common threat to resource loss (Grandey & Cropanzano, 1999; Hobfoll & Shirom, 2000). Thus, in the present study, STAR is expected to have beneficial effects on safety and OCBs by increasing perceptions of supervisor support and perceptions of control over work time and decreasing work–family conflict, leading to increased time and energy to allocate to safety compliance and OCBs.

Social support serves as both a direct and indirect buffer of the negative effects of stress on strain (Cohen & Wills, 1985) by providing emotional and instrumental resources to the receiver of the support. In a study by Odle-Dusseau, Britt, and Greene-Shortridge (2012), perceived FSSB was also shown to increase resources in the form of work–family enrichment and, in turn, improved performance outcomes over time . Furthermore, increasing social support and increasing control over work time, both considered contextual resources, have been shown to be related to decreased work–family conflict (e.g., Hammer, Kossek, Yragui, Bodner, & Hanson, 2009; Kelly et al., 2014). In sum, it is expected that STAR will lead to improved reports of work outcomes of safety compliance and OCBs, compared with a control group, through improvements in employee perceptions of FSSB, control over work time, and decreased work–family conflict, which theoretically are expected to impact personal time and energy resources, based on the work–home resources model (ten Brummelhuis & Bakker, 2012).

Intervention Target of Supervisor Support for Family and Personal Life (FSSB)

The concept of supervisor support for family and personal life, or FSSB, was developed by Hammer, Kossek, Zimmerman, and Daniels (2007) and Hammer et al. (2009), in which they operationalized the four-dimensional construct as including emotional support for employees' work–life challenges, modeling exemplary behaviors when handling their own work–family issues, looking for creative solutions that meet the needs of both employees and the organization, and facilitating employees' flexible work practices (Hammer et al., 2009). This form of support (i.e., FSSB) has been shown to account for significant variance in work–family conflict outcomes above and beyond the effects of general supervisor support (Hammer et al., 2009). Further, a recent meta-analysis showed that perceptions of supervisors' work–family support impacts work–family conflict through the mechanism of work–family organizational support (Kossek, Pichler, Bodner, & Hammer, 2011).

The training that supervisors received as part of STAR is specifically based on the four FSSB dimensions of Emotional Support, Instrumental Support, Role Modeling, and Creative Work–Family Management noted earlier (Hammer, Kossek, Bodner & Crain, 2013; Hammer et al., 2011). The goal of the training was to teach FSSB to supervisors, thus leading to improved employee perceptions of their supervisors' FSSB. Research has long recognized the critical role of supervisors in interpreting policies and acting as gatekeepers to the use of flexible work and family-leave policies (Blair-Loy & Wharton, 2002; Hammer et al., 2007; Hochschild, 1997; Kossek, Ollier-Malaterre, Lee, Pichler, & Hall, 2015). Recently, scholars have identified these specific dimensions of supervisor support for family and personal life as potentially effective intervention targets (Hammer et al., 2009, 2011) that lead to increased personal resources (e.g., work–family enrichment; Odle-Dusseau et al., 2012) and decreased resources loss (i.e., decreased work–family conflict). Odle-Dusseau et al. (2012) specifically demonstrated that work–family enrichment mediated the relationship between FSSB and supervisor ratings of performance over time. We suggested that additional workplace outcomes are employee reports of safety compliance and OCBs.

Based on COR and the work–home resources model (Grandey & Cropanzano, 1999; Hobfoll, 1989, 2001; ten Brummelhuis & Bakker, 2012), increased FSSB can act as a critical workplace contextual resource that leads to increased perceptions of FSSB and reduced work–family conflict (decreased resource loss), and, in turn, the retention of other valuable personal resources, namely, time and energy, which can then be used for increasing job-related behaviors such as safety compliance and OCBs. Social exchange theory has also been used to explain the relationship between perceived supervisor support for work and family leading to employees' desire to reciprocate and to increased OCBs (Bagger & Li, 2014). Additionally, it has been argued that making work–life programs available—another form of support related to FSSB—signals to employees that they are cared about, and this, in turn, increases the desire for a positive social exchange such as increased OCBs (Lambert, 2000). Thus, we expect the following:

Hypothesis 1: Compared with the control group, employees in the facilities randomized to the intervention report higher levels of (a) safety compliance, and (b) OCBs postintervention.

Hypothesis 2: Compared with the control group, employees in the facilities randomized to the intervention report higher levels of FSSB postintervention.

Hypothesis 3: FSSB perceptions will mediate the intervention effect on safety compliance and OCBs, as stated in Hypothesis 1.

Intervention Target of Control Over Work Time

Following COR theory and the work–home resources model (Grandey & Cropanzano, 1999; Hobfoll, 1989, 2001; ten Brummelhuis & Bakker, 2012), as well as resource drain theory (Edwards & Rothbard, 2000), greater control over work time is another contextual resource that allows employees to structure their work and nonwork time. By structuring time, strains such as work–family conflict can be ameliorated and personal resources such as time and energy can be maximized or retained, leading to improved behaviors such as safety compliance and OCBs.

Studies of control over work time have their roots in the earlier work of Karasek and colleagues (Karasek, 1979; Karasek, Baker, Marxer, Ahlbom, & Theorell, 1981; Karasek & Theorell, 1990), who argued that psychological strain was the result of high demands and low control. Additionally, research on the effectiveness of compressed work weeks (Dunham, Pierce, & Castaneda, 1987) and more recent work shows that employees who report greater perceived control over work time via increased workplace policies related to flexible work hours also report more beneficial outcomes, such as reduced work–family conflict and improved health behaviors (e.g., Kelly et al., 2008; Kossek, Lautsch, & Eaton, 2006; Moen, Kelly, & Lam, 2013).

Perceptions of control over work time is a second proposed mediating factor, in addition to perceptions of FSSB, in the WFHS, and was the focus of some of the pilot research. We argue that when people perceive higher FSSB and control over work time and lower work–family conflict, their personal resources are improved, leading to more time and energy focused on accomplishing behaviors such as safety compliance and OCBs. Furthermore, a recent natural experiment of the Results Only Work Environment (ROWE; Kelly et al., 2011; Moen, Kelly, & Hill, 2011) examined the effectiveness of an intervention aimed at increasing employee control over work time by teaching employees to focus on the results of their work regardless of where, when, and how they completed it. Compared with employees who did not participate in the ROWE program, employees in ROWE showed decreases in work–family conflict and greater increases in perceived control over work time 6 months later (Kelly et al., 2011). ROWE also affected the organization through improvements in behavioral outcomes, such as significantly lower turnover intentions for employees in departments that moved into ROWE (Moen et al., 2011). Thus, we expect the following:

Hypothesis 4: Compared with the control group, employees in the facilities randomized to the intervention report higher levels of control over work time postintervention.

Hypothesis 5: Control over work time perceptions will mediate the intervention effect on safety compliance and OCBs, as stated in Hypothesis 1.

Proximal Outcome of Work–Family Conflict

Work–family conflict occurs when demands in either domain are incompatible with the other (Greenhaus & Beutell, 1985), with time and energy being the most called-upon personal resources, and lack thereof being a primary source of conflict. Several studies suggest that family-to-work and work-to-family conflict are related to poor safety outcomes, such as reduced reports of safety compliance and occupational injury (e.g., Cullen & Hammer, 2007; Smith & DeJoy, 2012; Turner, Hershcovis, Reich, & Totterdell, 2014). Furthermore, Turner and colleagues (2014) note that a primary mechanism to rebuild finite time resources lost as a result of work–family conflict is speeding up work, taking shortcuts, and multitasking, leading to decreased safety behaviors. Halbesleben (2010) found these activities, termed *work-arounds*, to be positively related to injuries on the job. Additionally, competing demands for resources from work and nonwork domains, and individuals' inability to meet competing demands, can lead to psychological distress and further resource loss (Hobfoll, 2001), resulting in workplace injuries (e.g., Guastello, Gershon, & Murphy, 1999).

It is also likely that employee reports of OCBs, which are discretionary, will be negatively impacted by work–family conflict. As shown by Bragger, Rodriguez-Srednicki, Kutcher, Indovino, and Rosner (2005), work–family conflict makes going above and beyond at work more difficult. According to Hobfoll (1989), reductions in the personal resources time and energy, such as those that occur when work and family are in conflict, may lead to self-defeating behaviors such as reduced OCBs, as shown in previous research (e.g., Beham, 2011; Bragger et al., 2005; Lambert, 2000). Likewise, this is consistent with the work–home resources model, suggesting that low resources and high demands lead to work–family conflict. Thus, increased contextual resources provided by STAR should lead to reduced work–family conflict and improved behavioral outcomes, as suggested below:

Hypothesis 6: Compared with the control group, employees in the intervention group will report lower levels of (a) work-to-family conflict, and (b) family-to-work conflict postintervention.

Hypothesis 7: Work-to-family conflict and family-to-work conflict will mediate the intervention effect on safety compliance and OCBs, as stated in Hypothesis 1.

Baseline Moderators

In addition to mediators, we examined the baseline conditions under which the intervention is most effective; that is, we examined the moderating effects of baseline perceptions of FSSB, perceptions of control over work time, and perceptions of work–family climate. There is some theoretical rationale that suggests that organizational changes such as those targeted in our study may be more effective in already supportive, resource-rich environments (e.g., high FSSB, high control, and supportive work–family climates). Armenakis and Bedeian (1999) discussed organizational change models based on Bandura's (1986) social learning theory.

Change (in this case, as a result of the intervention) may be more successful if there are preexisting behavioral patterns that can be called upon, replicated, and revised slightly to fit within the proposed new procedures, rather than starting "from scratch." For instance, a supervisor who already provides some degree of emotional support to employees may be more successful in acquiring the related support skill of "modeling exemplary behaviors" through intervention activities. Furthermore, it has been argued that the degree to which work–family interventions are supported by leaders will impact their effectiveness (Kossek et al., 2015). More specifically, we argue that employee perceptions of baseline organizational contextual factors will impact the effectiveness of STAR such that when the workplace is perceived to be supportive with higher levels of perceived FSSB, perceived control over work time, and perceived supportive work–family climate, this will lead to more beneficial effects of the intervention compared with when the workplace is perceived to be less favorable. We anticipate, therefore, that the intervention will work better among those employees who perceive the organizational context as more favorable, and thus amenable to change. Thus, we expect the following:

> *Hypothesis 8:* The intervention effect stated in Hypothesis 1 will be stronger for employees reporting high baseline levels of perceived FSSB, perceived control over work time, and perceptions of work–family climate compared with those reporting low baseline levels of these variables.

In sum, this study makes an important contribution to the literature by (a) extending the outcomes of a work–family intervention evaluation to reports of safety compliance and OCBs; (b) examining theoretically and empirically based mediators that serve to help explain the process by which the effects of STAR, a work–family intervention, impacts workplace behavioral outcomes; (c) increasing the external validity of the effects of the intervention, previously examined only in a professional-level information technology industry, to a lower wage hourly health care industry; (d) examining the workplace conditions under which the intervention is most effective; and (e) describing a complex organizational intervention study that provides evidence-based information on effectiveness.

Method

Research Setting, Study Criteria, and Randomization

The study took place in a group of 30 extended-care facilities owned by a single organization, hereafter referred to by the pseudonym *Leef*. A for-profit extended nursing home health care company, Leef manages a total of 55 extended-care facilities. The 30 facilities in New England were identified to participate in the study by the organization's Vice President of Development as long as they were not currently engaged in other research studies. All 30 sites agreed to participate and none dropped out during the study. This is the first study to test intervention effects over time from this data set, although two other recent studies have examined baseline data relationships (Berkman et al., 2015; DePasquale et al., 2014).

To investigate the effects of STAR, facilities were assigned to either receive the intervention or continue with usual practice (control). An adaptive random assignment approach (Frane, 1998) was utilized to minimize potential imbalance on important facility characteristics between the treatment and control locations (see Bray et al., 2013, for a detailed description of this methodology). This sequential random assignment approach adjusts the probability of intervention condition assignment based on the level of imbalance across intervention conditions for important facility characteristics at a given point in the random assignment sequence. For example, if the average facility size is larger in the intervention than control conditions at a given point, a larger facility has a lower probability (e.g., $< .50$) of being assigned to the intervention condition for the next intervention condition assignment.

More specifically, three relevant criteria were identified to balance across the intervention and control conditions; these included (a) baseline retention rates of direct care employees (baseline retention rates ranged from ~52% to 84% per year), as this was thought to be a proxy for unobserved working conditions (a lower retention rate being associated with worse working conditions) that could impact the success of the intervention; (b) the state in which the site was located, as nursing home regulations varied significantly by state; and (c) the number of employees in each site, so as to keep an approximately equal number of employees in each condition.

There were also two logistical issues considered during randomization. First, the study needed to group or block nursing homes that were relatively nearby. Nursing homes that are going through the study simultaneously needed to be close to each other in order to reduce the travel burden on field interviewers and, consequently, data collection costs. Furthermore, this approach increased the similarity of the population of employees in intervention and usual-practice facilities. The nursing homes were also subject to random state audits during recertification periods. Data collection could not occur during these audit "blackout" periods because the audit required the nursing home's full attention. Thus, in addition to geographic proximity, the team grouped sites that were ready to begin data collection and that were not currently in an audit blackout period. These procedures did not in any way compromise the randomization.

Therefore, using our group-randomization approach, we matched intervention and control locations based on the number of employees, state, and retention rate. Given that locations were unable to commit to a timeline far in advance, we randomized work sites on a flow basis, while attempting to ensure balance on key characteristics. Baseline data collections began in September 2009, and the 12-month data collections finished in June 2012.

Participant Recruitment and Data Collection

To participate in the study data collection, employees had to meet the following eligibility criteria: (a) provide direct care to residents (e.g., registered nurse, certified/licensed nursing assistant), (b) work 24 hr or more a week, and (c) work day or evening shifts (i.e., not exclusively night shifts). Recruitment materials emphasized the value of investigating connections between employees' work, family, and health, and described how findings would benefit employees, the Leef organization, and scientific knowledge more broadly. Personnel trained in the data collection protocols met with the leadership of each facility, provided informational material in break rooms, and made themselves available

to employees to answer questions about participation. All recruitment materials and research personnel emphasized the independence of the research team from the Leef organization, and the strict confidentiality of individual data. Recruitment efforts took place within the 6 months prior to baseline data collections.

Research personnel involved with recruitment and data collection were blind to each facility's condition (i.e., intervention or control), and the "study" (i.e., data collection) was kept distinct from the intervention in two key ways. First, recruitment materials described the study goals as investigating how the organizational policies, practices, and culture affect the health and well-being of employees and their families, without reference to the intervention. Second, the intervention was rolled out as an independent, company-sponsored pilot program, with sessions and activities conducted by personnel who were independent of the recruitment and data collection team. Thus, both the participants and the research personnel collecting data were unaware of a facility's assignment to treatment. All baseline data were collected prior to any commencement of intervention activities.

Data collection occurred at the facilities, on paid company time, and consisted of 60-min computer-assisted personal interviews conducted by trained field interviewers at baseline (prior to the intervention), and again at 6- and 12-month follow-ups. Participants provided consent for each component of the data collection at each time point, and received up to $60 for each of the three data collections for the study activities described herein.

The Work–Family Intervention: STAR

The STAR intervention delivered in the present study was developed jointly by our research team and outside consultants as an integration of two previous interventions shown to be effective in WFHS pilot studies. The FSSB computer-based training and behavior tracking developed and evaluated by Hammer et al. (2011) was adapted for use in the WFHS, and was combined with participatory workshops based on ROWE and evaluated by Kelly et al. (2011). This adaptation involved a 1-year formative data collection study based on interviews, focus groups, and observations in two health care facilities that were not part of the larger study.

During this formative research, the computer-based training intervention used by Hammer et al. (2011) with low-wage hourly grocery store workers was modified to include examples and pictures specific to the health care industry, and an introductory video demonstrating Leef corporate leadership support for the STAR initiative was also embedded. In addition to the four dimensions of FSSB that were the focus of the training in the earlier version used by Hammer et al., we added a dimension of performance support that was related to more general supervisor skills and focused on support for task accomplishment. Both the FSSB and performance support dimensions were also identified in a behavior tracking exercise in which supervisors were asked to set goals and track behaviors using iPod touch devices that were preprogrammed and provided by the research team. This behavior tracking activity, aimed at increasing transfer of training, took just a couple of minutes a day and lasted for 2 weeks (Olson & Winchester, 2008).

The second intervention that was modified and then integrated with the computer-based supervisor training to make up STAR was based on ROWE, an adaptive change process implemented in teams and led by a trained facilitator from Culture Rx, an organizational development consulting firm. Again, the formative data collection period was used to inform the development and customization of ROWE, which has primarily been used with professional level workers, for our lower wage hourly health care employees at Leef.

The integrated STAR intervention was further customized for the health care industry we were studying. For example, workers in the health care industry experience erratic shifts because of government staffing regulations, and high levels of face time with virtually no opportunity for work off-site. Thus, it is possible that STAR could play out differently because of differences in the industry sectors (i.e., health care vs. information technology). In both sectors, however, STAR included face-to-face training sessions for supervisors to learn strategies to support employees' personal and family lives, while maintaining a high level of work performance, as well as a self-paced, computer-based training, followed by the behavior tracking of supportive behaviors via an iPod touch. For employees and supervisors, the intervention activities involved 8 hr of scripted interactive training sessions focused on targeted areas for change (e.g., attitudes and assumptions that employees who prioritized family responsibilities were less committed to their jobs), and identifying new work practices that would focus employees' time and attention on key work results rather than face time. The actual rollout of STAR took place over the course of 4 months. The intervention is described in further detail online, where intervention materials are available for download and use (www.WorkFamilyHealthNetwork.org). A document describing the summary of intervention activities and sample timeline is available in the online supplemental appendix for this article.

Measures

Below we describe the measures used in the current study. To handle occasional missing item responses to multi-item scales, we used a mean imputation approach for all scales with four or more items when at least 75% of the data were present. Otherwise, listwise deletion was employed to construct scale scores. There was very little missing data across the items within a scale for the sample, ranging from 1% to 8%.

Safety compliance. Safety compliance was assessed at all three time points, with four items measuring the extent to which employees reported following safety protocols (Neal, Griffin, & Hart, 2000). Employees responded to each item on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), baseline $\alpha = .89$, 6-month $\alpha = .91$, 12-month $\alpha = .91$. A sample item is "You use the correct safety procedures for carrying out your job."

OCBs. OCBs were assessed at all three time points, with four items measuring the degree to which employees were willing to assist coworkers (Lambert, 2000). An example item is "To what extent do you help your coworkers when they have too much to do?"; employees responded to each item on a scale ranging from 1 (*never*) to 5 (*all of the time*), baseline $\alpha = .71$, 6-month $\alpha = .72$, 12-month $\alpha = .74$.

FSSBs. FSSBs were assessed at all three time points as employee perceptions of supervisors' behavioral support for family and personal life. FSSB is distinct from general super-

visor support, in that some supervisors are supportive of employees doing their job, but not specifically of employees' family concerns. We used Hammer and colleagues' (2013) four-item short-form measure, with one question from each of four dimensions (i.e., Emotional Support, Instrumental Support, Role Modeling, and Creative Management) used to create a composite measure. Responses range from 1 (*strongly disagree*) to 5 (*strongly agree*), and a sample item is "Your supervisor works effectively with employees to creatively solve conflicts between work and nonwork" (baseline $\alpha = .89$, 6-month $\alpha = .90$, 12-month $\alpha = .90$).

Control over work time. Control over work time assessed the degree to which employees perceive they have control over their work time at all three time points using an eight-item scale based on Thomas and Ganster's (1995) measure and previously used in Kelly et al. (2011). A sample question is "How much choice do you have over when you begin and end each workday?" with responses ranging from 1 (*very little*) and 5 (*very much*), baseline $\alpha = .65$, 6-month $\alpha = .69$, 12-month $\alpha = .72$.

Work–family conflict. Work-to-family conflict and family-to-work conflict, reflecting the degree to which role responsibilities from one domain are incompatible with the other, were each assessed at all three time points using five-item scales developed and validated by Netemeyer, Boles, and McMurrian (1996). A sample work-to-family conflict item is "Due to your work-related duties, you have to make changes to your plans for family or personal activities." A sample family-to-work conflict item is "Family-related strain interferes with your ability to perform job-related duties." Item responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher values representing more conflict (work-to-family conflict, baseline $\alpha = .88$, 6-month $\alpha = .90$, 12-month $\alpha = .90$; family-to-work conflict, baseline $\alpha = .82$, 6-month $\alpha = .82$, 12-month $\alpha = .83$).

Perceptions of organizational work–family climate. This measure assessed, at baseline only, employees' perceptions of the climate at their workplace for making family sacrifices for the sake of their work (Kossek, Colquitt, & Noe, 2001). A sample item is "In your workplace, employees are expected to take time away from their family or personal lives to get their work done," and response options ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). Higher values represent a climate that is *more* supportive of work–family issues (baseline $\alpha = .65$).

Analytic Strategy

A three-level general linear mixed model approach for group-randomized designs was used (Donner & Klar, 2004; Murray, Varnell, & Blitstein, 2004; Varnell, Murray, Janega, & Blitstein, 2004) utilizing an intent-to-treat framework. Within these three-level models, time waves (baseline, 6-month follow-up, 12-month follow-up) were nested within participants, and participants were then nested within the 30 randomized study facilities. Estimated variance components and intraclass correlations at the location, employee, and within-employee levels are located in Table 1. Although this statistical model appears complex, conceptually this model is a general linear mixed model parameterization of a 2 (Condition: intervention vs. control) × 3 (Time Wave: baseline, 6 month, and 12 month) mixed-factorial ANOVA with location-level random effects. Thus, for each study outcome, the fixed effect model parameters involve functions of these six Conditions × Time Wave means (e.g., see Table 2). As there are several ways to parameterize the same ANOVA model (e.g., indicator vs. effects coding and a categorical vs. continuous treatment of time), we briefly describe our reasons for choosing the particular time wave model parameterization we used.

Treating time wave as a continuous variable can simplify the model parameterization (e.g., reducing the number of parameters) and aid in the communication of intervention effects in these models (i.e., differential change over time in the intervention and control conditions). This is particularly true when the number of time waves is large and the functional form of change over time is simple (e.g., linear or quadratic) relative to the number of time waves. However, with only three time waves, only two of which are postintervention, options to specify the functional form of change over time are rather limited and quickly saturate the implied mean structure. In such cases, there may be little or no savings in the number of model parameters needed relative to other approaches for the treatment of time wave.[1] Given that we did not hypothesize a priori the functional form of change over time in each condition, and that, empirically, some of the changes in outcome means appear to deviate from linearity (see Table 2), we decided to treat time wave as a categorical variable, such that the time wave parameters contrast each postintervention time wave with baseline. Importantly, intervention effects in these models appear as Intervention Condition × Time Wave interactions (e.g., differences in mean change from baseline to 6 months across the intervention and control conditions). SAS Proc Mixed (v 9.4; 2013) was used for these analyses using restricted maximum likelihood to estimate model random effects.

A benefit of using a general linear mixed model framework is that the approach generalizes easily to larger models with multiple outcome variables, such as those involved in mediation analysis or for tests of indirect effects (MacKinnon, 2008). Initial tests for the effect of the intervention on the mediators were conducted in SAS Proc Mixed (v 9.4; 2013) with restricted maximum likelihood to estimate model random effects.

Another benefit of the general linear mixed model framework is that the approach generalizes to models that can include continuous predictors or factors. We use this capacity to conduct an exploratory search for baseline characteristics that may moderate the intervention effects on the study outcomes (Hypothesis 8). For this purpose, baseline moderator effects, along with their higher order interactive effects with the intervention and time wave indicators, were added to the models described earlier. In this parameterization, moderated intervention effects appear as three-

[1] For example, with six Condition × Time means, there are up to six model parameters to account for these means. In a growth curve parameterization, these parameters include, for the control condition, an intercept, a linear trend, and a quadratic trend; parameters for the intervention condition include differences in the intercept and linear and quadratic trends relative to the control condition growth curve parameters. This results in the same number of model parameters as appears with the piecewise (i.e., categorical) treatment of time in this case. With more postintervention time points than are available in this article, there can be a savings in the number of growth curve parameters if the functional form of change is limited to linear and quadratic trends.

Table 1
Estimated Variance Components and Intraclass Correlations for Study Variables at the Location, Employee, and Within-Employee Levels

Variable	Estimated variance components			ICC (location)	ICC (employee)
	Location level	Employee level	Within-employee level		
Organizational citizenship behaviors	.00	.18*	.16*	.00	.53
Safety compliance	.00	.11*	.13*	.01	.46
Work-to-family conflict	.01*	.47*	.32*	.03	.60
Family-to-work conflict	.00*	.14*	.17*	.02	.46
Family supportive supervisor behaviors	.02*	.34*	.39*	.06	.47
Control over work time	.03*	.27*	.26*	.11	.51
Work–family climate	.02*	.34*	.35*	.04	.49

Note. ICC = intraclass correlation.
* $p < .05$.

way interactions (i.e., Baseline Moderator × Intervention Condition × Time Wave [relative to baseline]). All continuous baseline moderators were grand mean centered to aid in the interpretation of lower order effects.

Results

Sample Size and Missing Data

In total, 1,783 employees were eligible to participate in the study. Of the 1,783 employees eligible, 864 individuals were allocated to STAR and 919 individuals were allocated to the control group. At baseline, 1,524 surveys were completed, yielding a response rate of 85.5%, with 725 individuals in STAR and 799 in the control group. At the 6-month follow-up, 1,330 eligible employees were still working at Leef, with 96% completing surveys (n = 1,275). Of these individuals, 597 in STAR and 678 in the control group provided data at this follow-up. At 12 months, 1,148 employees were eligible with 94% completing surveys (n = 1,083). Data were provided by 501 individuals in STAR and 582 individuals in the control group at this follow-up. The final analyses were based on a sample of 725 in the STAR group and 799 in the control group. Between 24 and 89 direct care employees participated from each of the 30 facilities (M = 49.39, SD = 17.90). For a detailed description of the power analyses that were conducted, see Bray et al. (2013).

To explore patterns in the missing data because of attrition, several analyses were conducted using demographic variables and the outcomes of interest. Four participant groups were examined (i.e., those who participated only at baseline, those who participated only at baseline and 6 months, those who participated only at baseline and 12 months, and those who participated at all three time points). Those who participated at all three waves were significantly older (M = 39.22) than those who participated only at baseline (M = 36.84), and those who participated only at baseline and 12 months (M = 34.06), $F(3, 1518) = 4.37$, $p = .005$. In addition, those who participated only at baseline (M = .86) had significantly fewer children living in the home than those who participated only at baseline and 12 months (M = 1.40), and those who participated at all three waves (M = 1.06), $F(3, 1519) = 2.82$, $p = .038$. Importantly, no other variables, including the study outcome variables as well as the intervention condition indicator, varied significantly across these four participant groups.

Descriptive statistics and bivariate correlations for all study variables are presented in Tables 3 and 4. Table 2 provides, for descriptive purposes, the model-based means for each time point (i.e., baseline, 6 months, and 12 months) for STAR and control

Table 2
Means by Condition Over Time

Outcome	Condition	Baseline	6 months	12 months
Organizational citizenship behaviors	Control	4.14	4.04	3.98
	Intervention	4.10	4.04	4.03
Safety compliance	Control	4.48	4.42	4.39
	Intervention	4.51	4.51	4.46
Family-supportive supervisor behaviors	Control	3.72	3.61	3.61
	Intervention	3.67	3.64	3.65
Control over work time	Control	2.60	2.61	2.62
	Intervention	2.74	2.63	2.68
Work-to-family conflict	Control	2.76	2.74	2.66
	Intervention	2.85	2.85	2.80
Family-to-work conflict	Control	2.05	2.07	2.06
	Intervention	2.10	2.11	2.10

Note. Adjusted means derived from general linear mixed model results.

Table 3
Baseline Demographics of Control and Intervention Groups in Health Care Sample

	Control group (N = 798 to 799)	Intervention group (N = 724 to 725)
Age (*M*, *SD*)	39.03, 12.27	37.96, 12.69
Gender (% female)	90.70	93.00
Race (%)		
White, non-Hispanic	65.70	67.30
American Indian or Alaskan Native	.40	.10
Black or African American, non-Hispanic	12.90	15.00
Asian Indian	.40	.40
Other Asian	3.10	2.30
Other Pacific Islander	.50	.10
Hispanic	14.50	11.20
More than one race	2.50	3.30
Other	.00	.10
Married/cohabitating (%)	64.80	60.70
Children at home (%)	57.60	53.50
Number of children (*M, SD*)	1.07, 1.16	.99, 1.17
Eldercare (%)	27.90	32.40
Hours of work per week (*M, SD*)	37.32, 7.64	36.46, 6.70
Tenure in years (*M, SD*)	6.37, 6.66	6.13, 6.33

conditions; Tables 5 and 6 provide significance tests for specific contrasts of these means.

STAR Effects on Safety Compliance and OCBs

The primary purpose of this study was to evaluate the effects of STAR on participants' safety compliance and OCBs. Hypothesis 1 states that STAR will result in higher levels of these performance outcomes relative to the control condition. Table 5 provides these general linear mixed model results.

For safety compliance, a statistically significant STAR effect (i.e., Intervention × Wave interaction) was observed at 6 months, $\gamma = 0.06$, $t(56) = 2.22$, $p = .03$, $d = 0.12$; the magnitude of the standardized effect size d would be considered small in the social and behavioral sciences (Cohen, 1988).[2] The STAR effect on safety compliance, however, was no longer statistically significant at 12 months, $\gamma = 0.04$, $t(56) = 1.49$, $p = .14$, $d = 0.08$, indicating that STAR effects did not endure to the 12-month time point. To clarify the nature of STAR effects on safety compliance at 6 months, consider the 6-month wave effect in the control arm of the study for this model in Table 5. The 6-month wave effect in the model indicates a significant reduction in safety compliance from baseline to 6 months in the control facilities, $\gamma = -0.06$, $t(56) = -3.32$, $p = .002$. Thus, the effects of STAR on safety compliance at 6 months appears to have counteracted this general decline; the change in safety compliance from baseline to 6 months in the STAR facilities was not statistically significant, $\gamma = -0.00$, $t(56) = -0.08$, $p = .94$.

For OCBs, no statistically significant STAR effect (i.e., Intervention × Wave interaction) was observed at 6 months, $\gamma = 0.05$, $t(56) = 1.56$, $p = .12$, $d = 0.09$; however, a significant STAR effect was observed at 12 months, $\gamma = 0.09$, $t(56) = 2.77$, $p = .008$, $d = 0.16$, which should be considered small in magnitude (Cohen, 1988). To clarify the nature of the STAR effect on OCBs at 12 months, consider the 12-month wave effect in the control arm of the study for this model in Table 5. The 12-month wave effect in the model indicates a significant reduction in OCBs from baseline to 12 months in the control facilities, $\gamma = -0.17$, $t(56) = -7.65$, $p < .0001$. Thus, the STAR effect on OCBs at 12 months appears to have offset some of this general decline; indeed, the change in OCBs from baseline to 12 months in the STAR facilities still represents a statistically significant decline, $\gamma = -0.08$, $t(56) = -3.35$, $p = .002$, but the magnitude of the decline is about half the size.

Together, these results do not support Hypotheses 1a and 1b; however, the meaningful positive effects of the intervention on these outcomes remain. The nature of the intervention effects are not increases in these outcomes (relative to the control condition, in which no change was expected), but rather a lessening of decreases in both outcomes relative to the control condition. Furthermore, the STAR effects on safety compliance and OCBs appear isolated to specific times relative to baseline. For safety compliance, the STAR effect apparent at 6 months is not observed at 12 months; for the OCBs, the opposite trend is observed. Both significant STAR effects are small in size and appear to be protective effects, given the significant declines for both outcomes over time in the control facilities.

STAR Effects on Intended Intervention Targets and Proximal Constructs

We next turn to a set of analyses designed to test the mediating role of the intended intervention targets (i.e., FSSB and control over work time) and the proximal constructs (i.e., work-to-family conflict and family-to-work conflict) that STAR was designed to impact to bring about changes in safety compliance and OCBs. Table 6 provides the results of a series of general linear mixed models testing for intervention effects on FSSB, control over work time, work-to-family conflict, and family-to-work conflict.

[2] From Table 5, the effect size d equals the estimated difference in mean change over time from baseline to that time point across STAR conditions divided by the square root of the sum of the random effects for that model.

Table 4
Descriptives and Correlations of Study Variables

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Intervention	.48	.50	—																		
2. Baseline organizational citizenship behaviors	4.12	.57	−.04	—																	
3. 6-month organizational citizenship behaviors	4.04	.56	.00	.53**	—																
4. 12-month organizational citizenship behaviors	4.00	.58	.05	.50**	.63**	—															
5. Baseline safety compliance	4.50	.49	.03	.19**	.18**	.15**	—														
6. 6-month safety compliance	4.45	.51	.08**	.16**	.21**	.21**	.42**	—													
7. 12-month safety compliance	4.43	.49	.06*	.17**	.24**	.26**	.43**	.52**	—												
8. Baseline work-to-family conflict	2.79	.91	.10	−.02	.02	.04	−.07*	−.06*	−.04	—											
9. 6-month work-to-family conflict	2.77	.89	.06*	−.02	.02	.03	−.00	−.03	−.03	.59**	—										
10. 12-month work-to-family conflict	2.68	.88	.06*	−.02	.00	.03	−.06*	−.02	−.02	.56**	.64**	—									
11. Baseline family-to-work conflict	2.07	.58	.04	−.08**	−.05	−.05	−.19**	−.11**	−.13**	.41**	.30**	.26**	—								
12. 6-month family-to-work conflict	2.09	.55	.03	−.06*	−.07*	−.01	−.17**	−.13**	−.13**	.28**	.42**	.31**	.46**	—							
13. 12-month family-to-work conflict	2.07	.55	.03	−.06*	−.10**	−.11**	−.20**	−.16**	−.17**	.26**	.31**	.43**	.41**	.49**	—						
14. Baseline control over work time	2.65	.73	.09**	.00	.01	.01	.08**	.07*	.08*	−.20**	−.13**	−.16**	−.09**	−.07*	−.10**	—					
15. 6-month control over work time	2.60	.75	−.01	.02	.03	.02	.09**	.09**	.09**	−.16**	−.25**	−.24**	−.07*	−.08**	−.12**	.51**	—				
16. 12-month control over work time	2.64	.77	.01	.01	.02	.03	.07*	.06*	.10**	−.21**	−.21**	−.26**	−.10**	−.09**	−.11**	.52**	.62**	—			
17. Baseline family supportive supervisor behavior	3.69	.88	−.03	.05*	.06*	.06	.14**	.12**	.11**	−.22**	−.17**	−.18**	−.11**	−.07**	−.12**	.21**	.18**	.15**	—		
18. 6-month family supportive supervisor behavior	3.62	.88	.00	.04	.09**	.04	.07**	.09**	.09**	−.14**	−.23**	−.23**	−.05	−.07*	−.13**	.17**	.25**	.20**	.51**	—	
19. 12–month family supportive supervisor behavior	3.65	.84	.02	.01	.05	.02	.08*	.09**	.07*	−.18**	−.20**	−.25**	−.11**	−.10**	−.15**	.16**	.18**	.19**	.42**	.57**	—
20. Baseline work–family climate	2.88	.83	.04	−.08**	−.07*	−.06	−.02	−.01	.01	−.34**	−.21**	−.20**	−.17**	−.13**	−.10**	.19**	.13**	.21**	.10**	.08**	.10

Note. $N = 1{,}044$ to 1,521. Intervention coded as 1 = intervention, 0 = control.
* $p < .05$. ** $p < .01$.

Table 5
General Linear Mixed Model Results for Intervention Effects on Safety Compliance and Organizational Citizenship Behaviors

	DV: Safety compliance		DV: Organizational citizenship behaviors	
	Estimate	*SE*	Estimate	*SE*
Fixed effects				
Intercept	4.48*	.020	4.14*	.020
Intervention (at baseline)	.02	.030	−.04	.029
6-month wave (in control facilities)	−.06*	.020	−.11*	.020
12-month wave (in control facilities)	−.09*	.021	−.17*	.022
Intervention × 6-month wave (6-month intervention effect)	.06*	.029	.05	.030
Intervention × 12-month wave (12-month intervention effect)	.04	.030	.09*	.032
Random effects				
Residual	.14*	.004	.15*	.004
CS covariance	.11*	.006	.18*	.009
Location intercept variance	.002	.001	NE	NE

Note. Intervention coded as 1 = intervention, 0 = control; 6-month wave coded as 1 = 6-month wave, 0 = other; 12-month wave coded as 1 = 12-month wave, 0 = other. DV = dependent variable; CS = compound symmetric; NE = not estimable because of lack of variability in estimated intercepts across facilities conditional on the other effects in the model.
* $p < .05$.

Intended intervention targets. No significant STAR effects were observed for FSSB at 6 months, $\gamma = 0.07$, $t(56) = 1.49$, $p = .14$, $d = 0.08$, and at 12 months, $\gamma = 0.09$, $t(56) = 1.87$, $p = .07$, $d = 0.10$. As with safety compliance and OCBs, significant decreases in FSSB were observed in the control facilities from baseline to 6 months, $\gamma = -0.10$, $t(56) = -3.14$, $p = .003$, and from baseline to 12 months, $\gamma = -0.11$, $t(56) = 3.20$, $p = .002$; the nonsignificant STAR effects indicate that the intervention did not ameliorate these declines.

In contrast, a significant STAR effect was observed for control over work time at 6 months, $\gamma = -0.12$, $t(56) = -3.08$, $p = .003$, $d = -0.16$; however, this effect was no longer statistically significant at 12 months, $\gamma = -0.08$, $t(56) = 1.82$, $p = .07$, $d = -0.11$. The nature of the significant effect at 6 months, however, was the opposite of what was expected. Note that the changes over time for control over work time in the control facilities were not statistically significant at 6 months, $\gamma = 0.01$, $t(56) = 0.24$, $p = .81$, and 12 months, $\gamma = 0.02$, $t(56) = 0.64$, $p = .52$. The significant STAR effect at 6 months represents a *decrease* in control over work time relative to the change in the control facilities; indeed, the change in control over work time from baseline to 6 months in the STAR facilities was statistically significant, $\gamma = -0.11$, $t(56) = -4.00$, $p < .001$.

Table 6
General Linear Mixed Model Results for Intervention Effects on Family Supportive Supervisor Behaviors, Control Over Work Time, Work-to-Family Conflict, and Family-to-Work Conflict

	Intended intervention constructs				Theoretical causal mediators			
	DV: Family supportive supervisor behaviors		DV: Control over work time		DV: Work-to-family conflict		DV: Family-to-work conflict	
	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*
Fixed effects								
Intercept	3.72*	.053	2.60*	.054	2.76*	.042	2.05*	.027
Intervention (at baseline)	−.05	.076	.14	.076	.08	.060	.05	.039
6-month wave (in control facilities)	−.10*	.033	.01	.027	−.03	.030	.02	.022
12-month wave (in control facilities)	−.11*	.034	.02	.028	−.10*	.032	.02	.023
Intervention × 6-month wave (6-month intervention effect)	.07	.048	−.12*	.039	.03	.044	−.02	.032
Intervention × 12-month wave (12-month intervention effect)	.09	.050	−.08	.042	.05	.047	−.01	.034
Random effects								
Residual	.37*	.011	.25*	.007	.32*	.009	.17*	.005
CS covariance	.36*	.020	.27*	.014	.47*	.023	.14*	.008
Location intercept variance	.03*	.011	.03*	.011	.01*	.006	.01*	.002

Note. Intervention coded as 1 = intervention, 0 = control; 6-month wave coded as 1 = 6-month wave, 0 = other; 12-month wave coded as 1 = 12-month wave, 0 = other. DV = dependent variable; CS = compound symmetric.
* $p < .05$.

Proximal constructs. No significant STAR effects were observed for work-to-family conflict at 6 months, $\gamma = 0.03$, $t(56) = 0.67$, $p = .51$, $d = 0.03$, and at 12 months, $\gamma = 0.05$, $t(56) = 1.09$, $p = .28$, $d = 0.06$. In the control facilities, no significant change in work-to-family conflict was observed from baseline to 6 months, $\gamma = -0.03$, $t(56) = -0.90$, $p = .37$, but a significant decrease was observed from baseline to 12 months, $\gamma = -0.10$, $t(56) = -3.11$, $p = .003$. The nonsignificant STAR effects indicate that the intervention did not ameliorate these declines when significant. Similarly, no significant STAR effects were observed for family-to-work conflict at 6 months, $\gamma = -0.02$, $t(56) = -0.50$, $p = .62$, $d = -0.04$, and at 12 months, $\gamma = -0.02$, $t(56) = -0.39$, $p = .70$, $d = -0.02$. In the control facilities, no significant changes in family-to-work conflict were observed from baseline to 6 months, $\gamma = 0.02$, $t(56) = 1.01$, $p = .32$, and from baseline to 12 months, $\gamma = 0.02$, $t(56) = 0.75$, $p = .46$. The nonsignificant STAR effects indicate that the intervention did not improve upon these nonsignificant trends.

Summary. It is clear that STAR did not have the expected effects on the intervention targets and proximal constructs of FSSB, control over work time, and work-to-family and family-to-work conflict. As a result, these intervention target and proximal construct variables cannot be mediators of STAR effects on safety compliance and OCBs. Therefore, Hypotheses 2 through 7 were not supported. We consider the implications of these results in the Discussion.

Moderated STAR Effects

Finally, we tested whether STAR effects on safety compliance and OCBs were stronger when employees had higher baseline levels of FSSB, control over work hours, and perceived work–family climate (Hypothesis 8). In the model results presented in Table 7, moderated STAR effects appear as three-way interaction effects (i.e., Intervention × Wave × Baseline Moderator); baseline moderators were grand mean centered to aid in the interpretation of effects.

As displayed in Table 7, two baseline variables were found to moderate STAR effects on safety compliance in the expected directions: STAR effects were more beneficial with higher levels of FSSB and perceptions of work–family climate[3] compared with lower baseline levels of these moderators. The former moderated the significant STAR effect at 6 months, $\gamma = 0.08$, $t(56) = 2.28$, $p = .02$, pseudo $\Delta R^2 < .01$; the latter moderated the nonsignificant STAR effect at 12 months, $\gamma = 0.08$, $t(56) = 2.16$, $p = .03$, pseudo $\Delta R^2 < .01$. Given the estimated effect sizes, these moderated STAR effects should be considered small in magnitude. Figure 2 displays the nature of these moderated effects evaluated at one standard deviation above and below the baseline moderator variable means. In the upper panel, a larger and more beneficial STAR effect at 6 months is observed for those with higher compared with lower baseline perceptions of FSSB. In the lower panel, a larger and more beneficial STAR effect at 12 months is observed for those with higher compared with lower baseline perceptions of work–family climate.

As displayed in Table 7, one baseline variable was found to moderate the significant STAR effect on OCBs at 12 months, control over work time, $\gamma = 0.11$, $t(56) = 2.52$, $p = .01$, pseudo $\Delta R^2 < .01$. Given the estimated effect size, this moderated intervention effect should be considered small in magnitude. Figure 3 displays the nature of this moderated intervention effect; a larger and more beneficial STAR effect at 12 months is observed for those with higher compared with lower baseline control over work time, as expected.

Together, these three moderated STAR effects suggest that the impact of the work–family intervention on safety compliance and OCBs was significantly related to organizational context and "readiness" to change. These results provide partial support for Hypothesis 8.

Discussion

Within the context of relatively limited research on lower income workers (see Hammer et al., 2011; Henly & Lambert, 2014, for exceptions), this is the first U.S. study to report that distal workplace outcomes changed as result of STAR in the lower wage health care industry. Overall, STAR had significant effects on both safety compliance and OCBs via protecting intervention group workers against more dramatic declines in outcomes observed in the control group over time. The results of this study suggest that changing organizations to improve support and control for low-income workers creates an organizational context that fosters employee job performance behaviors that matter—complying with safety regulations and OCBs. As Kossek and Ozeki (1998) argued in their seminal work on links between work–family conflict, human resource policies, and job and life outcomes, very few studies examine whether work–family initiatives actually improve the workplace. This study adds to the literature by providing one of the only group-randomized trials evaluating a work–family initiative. The results of the present study provide insights into how STAR may influence workplace outcomes, and under what circumstances the intervention is most effective, while also shedding light on opportunities for future inquiry in this important area of scholarship.

The results of the present study also provide insights into how STAR may influence workplace outcomes, and under what circumstances the intervention is most effective, while also shedding light on opportunities for future inquiry. We know from previous work that STAR significantly reduced work–family conflict (Kelly et al., 2014), increased parental time with children (Davis et al., 2015), and improved sleep outcomes for employees (Olson et al., 2015) and for employees' children (McHale et al., 2015), all within a professional-level information technology industry. Although STAR was designed to increase workplace resources of FSSB and control over work time and decrease resource loss related to work–family conflict, our findings were not supportive of these mediating mechanisms in the current study population of low-wage, hourly workers. However, we identified baseline organizational context conditions that moderated the impact of the intervention, providing insight into the STAR effects. Namely, the effects of STAR were stronger when FSSB, control over work, and

[3] Analyses were based on perceptions of work–family climate rather than an aggregated measure. The intraclass correlation at the facility level was .04. Thus, a very small amount of variance in work–family climate can be attributed to differences between facilities within the organization, suggesting that the measure should not be aggregated for the current analyses.

Table 7
General Linear Mixed Model Results for Moderated Intervention Effects on Safety Compliance and Organizational Citizenship Behaviors at 6 and 12 Months

	DV: Safety compliance				DV: Organizational citizenship behaviors	
	Moderator: Family supportive supervisor behaviors		Moderator: Perceived work-family climate		Moderator: Control over work time	
	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*
Fixed effects						
Intercept	4.48*	.020	4.48*	.021	4.15*	.020
Intervention (at baseline at moderator mean)	.03	.029	.03	.030	−.04	.030
6-month wave (in control facilities at moderator mean)	−.06*	.020	−.06*	.020	−.11*	.021
12-month wave (in control facilities at moderator mean)	−.09*	.021	−.09*	.021	−.17*	.022
Intervention × 6-month wave (6-month intervention effect at moderator mean)	.06*	.029	.06*	.028	.05	.030
Intervention × 12-month wave (12-month intervention effect at moderator mean)	.04	.030	.04	.030	.09*	.032
Moderator (at baseline in control facilities)	.10*	.020	.02	.022	.01	.028
Moderator × Intervention (at baseline)	−.04	.029	−.06	.031	−.01	.040
Moderator × 6-month wave (in control facilities)	−.04	.023	.00	.024	−.02	.029
Moderator × 12-month wave (in control facilities)	−.04	.024	−.04	.026	−.05	.030
Moderator × Intervention × 6-month wave (6-month moderated intervention effect)	.08*	.033	−.00	.035	.05	.042
Moderator × Intervention × 12-month wave (12-month moderated intervention effect)	.05	.035	.08*	.037	.11*	.044
Random effects						
Residual	.13*	.004	.13*	.004	.15*	.004
CS covariance	.11*	.006	.11*	.006	.18*	.009
Location intercept variance	.00	.001	.00	.001	NE	NE

Note. Moderators are grand-mean centered. Intervention coded as 1 = intervention, 0 = control; 6-month wave coded as 1 = 6-month wave, 0 = other; 12-month wave coded as 1 = 12-month wave, 0 = other. DV = dependent variable; CS = compound symmetric; NE = not estimable because of lack of variability in estimated intercepts across facilities conditional on the other effects in the model.
* $p < .05$.

perceptions of the work–family climate were higher compared with when these baseline context conditions were lower.

Safety Compliance and OCBs

Results demonstrated that safety compliance significantly declined at the 6- and 12-month follow-ups compared with baseline in the control group, but did not significantly change from baseline at either follow-up wave for the STAR group. The decline from baseline to 6 months in the control group differed significantly from the change from baseline to 6 months in the intervention group, a pattern suggesting that STAR had a protective effect on initial decreases in safety compliance that occurred in these workplaces. In addition, OCBs significantly declined over time in both the STAR and control facilities, but the decline was less pronounced in the STAR facilities at the 12-month follow-up, indicating that STAR had a protective effect on longer term decreases in OCBs over time. Although it is unclear why safety compliance and OCBs declined over time in the control group, it appears that STAR seemed to prevent a similar decline in the intervention group, which is critically important in the health care industry, in which lives are at stake (Clark et al., 2014). Although we would like to assume that these protective effects were the result of increases in the intervention targets of FSSB and control over work time, unfortunately, those mediating mechanisms were not supported, as discussed further below.

Mediating Mechanisms Effects

Despite the customization of STAR for health care workers in the current study (Kossek et al., 2014), our findings suggest that the primary mediators—both intervention targets (FSSB and control over work time) and proximal constructs (work-to-family conflict and family-to-work conflict)—that we hypothesized would be altered by STAR did not change in this setting. These theoretically derived hypothesized changes were found when STAR was employed in an information technology industry that naturally afforded greater control and flexibility from the start (Kelly et al., 2014).

The health care industry tends to be a highly regulated working environment, which may have predisposed the intervention to be less effective compared with the office environment examined by others (e.g., Kelly et al., 2014). For example, it is clearly more difficult to increase perceptions of control over work time in an hourly workforce environment compared with a professional workforce environment. Although some of this was addressed in the customization of STAR for health care, and we were well aware that increasing control over work time was going to be more challenging to implement in the health care industry compared with the information technology industry (see Kossek et al., 2014, for more information on the customization of STAR across industries), we believed that there were still ways of targeting STAR components in the hourly workplace environment.

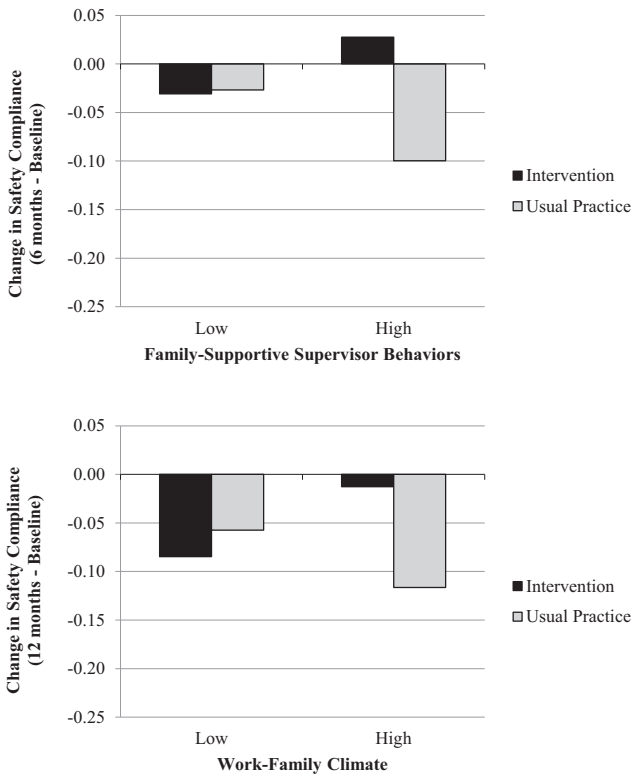

Figure 2. Change in safety compliance over time across intervention conditions as moderated by baseline family supportive supervisor behavior ratings (top) and baseline perceptions of work–family climate ratings (bottom). High and low moderator variable values defined as ±1 *SD* from baseline mean value.

Although some may argue that STAR may not have been tailored enough for this industry from the start, we argue that continued examination of ways to improve the work environment for highly structured jobs that tend to also be those in the lower pay brackets is important. The workers in these jobs tend to be those most in need of work–family interventions, as they have critical demands on their day-to-day lives and limited ability and resources to be responsive to such demands. With that said, our process evaluation accounts of the intervention effectiveness indicated that control over work time was manifested more in control over work *processes* rather than control over work *time*. For example, although it was much more difficult, and in some cases impossible, to change work hours without formal changes to tightly coordinated work schedules, workers indicated changing aspects of their work that they had control over such as increasing informal swapping of shifts. These activities, although still based on control over time theoretically, may not have been captured by our measure of "control over work time."

Although control over work time may be limited compared with a professional-level work environment, there was room for improvement, and we should not give up on the idea of increasing control over work time in lower wage, hourly workforce environments. For example, of critical importance are efforts by Henly and Lambert (2014) and others focusing specifically on how to increase workplace flexibility (a form of control over work time), and other types of work time practices that lead to greater control, in lower wage hourly environments. Their research suggests that providing employees with more predictable schedules, making it easier to arrange child care and other family demands in relation to work, and providing advance notice of work hours and allowing shift changes without penalty, are the work time practices that are needed to assist lower wage workers with work–family stressors and challenges.

Furthermore, we argue that it is still critically important to train supervisors to be more supportive of work–life integration, even in the lower wage and highly regimented health care environment. Additionally, the supervisors were likely under constraints similar to the hourly workers, related to the provision of support and control, and thus may have had limited scope in providing the types of FSSBs, such as Instrumental Support, that may have been needed by employees. Supervisors may also have been limited in modeling their own work–life balance behaviors because of the type of work environment and restrictions around work hours. Regardless of these issues, we argue that it is important to continue to find ways of providing supervisor support and control over work time for workers in this lower wage, more regulated and structured work environment.

It is possible that measurement issues could also be at play and provide alternative explanations for the lack of mediating effects. The strong theoretical foundation for the intervention may not have been captured by the self-reported mediating variables. There are likely numerous other potential mechanisms through which the intervention impacted safety compliance and OCBs, which we simply did not, or could not, measure (e.g., increased coworker communication about work design leading to improved teamwork and safer practices). Given the failure to find significant mediational effects in this article, we tested several additional theoretically driven relevant mediators we had in the data set post hoc. We specifically tested emotional exhaustion, job demands, and decision authority for potential significant mediating effects, as we believed that a case could have been made for each of these. None of these, in the end, proved to be significant mediators.

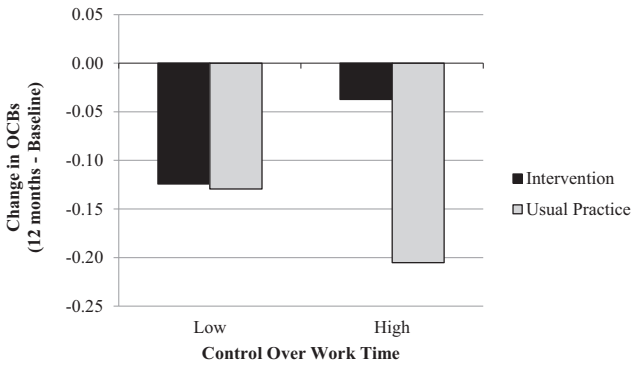

Figure 3. Change in organizational citizenship behaviors (OCBs) over time across intervention conditions as moderated by baseline control over work time ratings. High and low moderator variable values defined as ±1 *SD* from baseline mean value.

Baseline Moderators

By accounting for baseline levels of FSSB, control over work time, and perceptions of work–family climate as moderators, we uncovered intricacies of initial workplace conditions that relate to STAR's effectiveness. STAR led to improvements in safety compliance at the 6-month follow-up when supervisors were reported to exhibit higher FSSB prior to the intervention. This is an important finding because it shows that STAR had more than a protective effect, and in fact led to increased safety compliance when FSSB at baseline was high compared with when FSSB was low. Additionally, STAR protected against decreases in safety compliance at the 12-month follow-up, especially when employees perceived a more supportive work–family climate at baseline. When examining baseline levels of control over work time as a moderator, we further uncovered the complexity of the relationship between STAR and OCBs, such that high baseline levels of control over work time served to buffer against declines in OCBs. Taken together, these findings suggest that STAR was more effective when the baseline work environment was characterized by more resources to begin with (i.e., higher levels of FSSB, control over work time, and work–family climate). We suggest that this is a signal that such facilities were more ready for change.

Limitations and Future Directions

The present study is not without limitations, some of which have been noted, and many of which provide fertile ground for future research. Our focus on a specific industry is a primary limitation of the present study, yet this can also be viewed as a strength. It is possible, if not probable, that aspects of STAR may operate differently, and influence outcomes in other ways, in different occupational settings outside of the health care industry, such as retail, transportation, or even construction. These issues considered, the health care industry is continuously growing, and as of May 2013, represented 8.8% of all jobs in the United States, according to the Bureau of Labor Statistics (2014). Although the industry-specific sample may limit generalizability of the findings, we view the health care industry sample as a strength, as we aim to learn more about this large and growing number of employed individuals. As previously mentioned, when STAR was deployed in a sample of information technology employees, reductions in work-to-family conflict were found (Kelly et al., 2014). Thus, this particular type of intervention may be more successful in professional-level samples, calling for future research to examine additional intervention targets that promote change within varying types of employment scenarios. However, we believe that it is of utmost importance to continue to study ways of changing the work environment to increase both support and control in lower wage, hourly workplace industries, as these may very well be the workers who need these types of interventions the most.

An additional limitation is that several shortened measures were used to reduce participant burden. Although shortened measures are well-validated (e.g., FSSB-SF; Hammer et al., 2013), their use precluded our ability to investigate the potential differential roles of construct subdimensions. With a broader multidimensional measure of work–family conflict (e.g., Carlson, Kacmar, & Williams, 2000), researchers could examine the roles played by each subdimension (i.e., time, strain, and behavior) to more completely explore the role of this critical mechanism.

Future research should also investigate alternative mechanisms through which the intervention may influence these important organizational outcomes, for example, perceptions of organizational justice (e.g., Judge & Colquitt, 2004). Additional outcomes in the broadly construed job performance domain could also be explored, including, for example, safety participation (Neal & Griffin, 2006) and counterproductive work behaviors (e.g., Fox, Spector, & Miles, 2001). Lastly, the time-varying intervention effects found for the two different performance outcomes in the present study draw attention to the issue of time, a critical but often overlooked component in intervention development and longitudinal evaluation. Although we anticipated effects to be somewhat lagged because of organizational change processes, further research is needed to better understand both timing and sustainability of intervention effects.

Conclusions

In summary, we conducted one of the only work–family intervention studies to date using a group-randomized design. We further believe that it is important to continue to find ways of improving the work environment in lower wage, hourly workforce settings. Our results demonstrate that STAR protected against declines in OCBs and safety compliance compared with control facilities. We did not identify mediating mechanisms related to increased FSSB and control over work time and decreased WFC. However, we did find significant and important moderators related to the organization's readiness to change that further buffered the declines in the outcomes.

This study is important given the significance of work–family stress in the working population, the related negative effects of work–family stress on health and well-being of employees (see Hammer & Sauter, 2013, for a recent review), and the potential negative effects on work performance and return-on-investment outcomes for employers (Hammer et al., in press, for a review). Future research is needed to further understand the mechanisms through which the STAR intervention operates, the workplace moderators that impact STAR effectiveness, as well as a need for extending this intervention to further promote beneficial workplace, work–family, and health outcomes of employees and organizations in other industries.

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