

9-7-2015

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

Leslie B. Hammer

Portland State University, hammerl@pdx.edu

Ryan C. Johnson

Ohio University

Tori Laurelle Crain

Portland State University

Todd Bodner

Portland State University, tbodner@pdx.edu

Ellen Ernst Kossek

Purdue University

See next page for additional authors

Let us know how access to this document benefits you.

Follow this and additional works at: http://pdxscholar.library.pdx.edu/psy_fac

 Part of the [Industrial and Organizational Psychology Commons](#)

Citation Details

Hammer, L. B., Johnson, R. C., Crain, T. L., Bodner, T., Kossek, E. E., Davis, K. D., ... & Berkman, L. (2015). Intervention Effects on Safety Compliance and Citizenship Behaviors: Evidence From the Work, Family, and Health Study.

This Post-Print is brought to you for free and open access. It has been accepted for inclusion in Psychology Faculty Publications and Presentations by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.

Authors

Leslie B. Hammer, Ryan C. Johnson, Tori Laurelle Crain, Todd Bodner, Ellen Ernst Kossek, Kelly Davis, Erin L. Kelly, Orfeu M. Buxton, Georgia Karuntzos, L. Casey Chosewood, and Lisa Berkman

Intervention Effects on Safety Compliance and Citizenship Behaviors:

Evidence from the Work, Family, and Health Study

Leslie B. Hammer

Ryan C. Johnson

Tori L. Crain

Todd Bodner

Ellen Ernst Kossek

Kelly D. Davis

Erin L. Kelly

Orfeu M. Buxton

Georgia Karuntzos

L. Casey Chosewood

Lisa Berkman

Author Note

Leslie B. Hammer, Department of Psychology, Portland State University; Ryan C. Johnson, Department of Psychology, Ohio University; Tori L. Crain, Department of Psychology, Portland State University; Todd Bodner, Department of Psychology; Ellen Ernst Kossek, Krannert School of Management, Purdue University; Kelly Davis, Clearinghouse for Military Family Readiness, Human Development & Family Studies, Pennsylvania State University; Erin L. Kelly, Department of Sociology, University of Minnesota; Orfeu M. Buxton, Department of Biobehavioral Health, Pennsylvania State University, Department of Medicine, Harvard Medical School, Division of Sleep Medicine, Brigham and Women's Hospital, Boston, Massachusetts; Georgia Karuntzos, RTI International; L. Casey Chosewood, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention; Lisa Berkman, Harvard School of Public Health, Harvard University.

This research was conducted as part of the Work, Family and Health Network (www.WorkFamilyHealthNetwork.org), which is funded by a cooperative agreement through the National Institutes of Health and the Centers for Disease Control and Prevention: Eunice Kennedy Shriver National Institute of Child Health and Human Development (Grant # U01HD051217, U01HD051218, U01HD051256, U01HD051276), National Institute on Aging

(Grant # U01AG027669), the National Heart, Lung and Blood Institute (R01HL107240), Office of Behavioral and Science Sciences Research, and National Institute for Occupational Safety and Health (Grant # U01OH008788, U01HD059773). Grants from the William T. Grant Foundation, Alfred P Sloan Foundation, and the Administration for Children and Families have provided additional funding. The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of these institutes and offices. Special acknowledgement goes to Extramural Staff Science Collaborator, Rosalind Berkowitz King, Ph.D. and Lynne Casper, Ph.D. for design of the original Workplace, Family, Health and Well-Being Network Initiative.

Correspondence concerning this article should be addressed to Leslie B. Hammer, Department of Psychology, Portland State University, 1721 SW Broadway St., Portland, OR 97207. Contact: hammerl@pdx.edu.

Abstract

We tested the effects of a work-family intervention on employee reports of safety compliance and organizational citizenship behaviors in 30 healthcare 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, 6-month and 12-month post-intervention 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 to 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 the intervention effect on the self-reported safety compliance and organizational citizenship behavior outcomes.

Keywords: group-randomized trial, work-family conflict, family supportive supervisor behavior, safety compliance, organizational citizenship behavior

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

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, 2015 for a review). National surveys continue to point to the intersection of work and non-work 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 healthcare industry (i.e., extended care nursing homes): employee reports of safety compliance and organizational citizenship behaviors (OCBs). Safety is a primary concern in healthcare settings because patients' lives are on the line, with disease transmission and injury due 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, healthcare 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 healthcare 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 is 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 multi-level, 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; FSSB) 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 paper, in our online 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 healthcare 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 post-intervention. 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 post-intervention. 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 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 healthcare 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 and discussed below.

Insert Figure 1 about here

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.

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., 2015; 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.

Conservation of Resources 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 which the individual values. Social support and increased autonomy associated with increased control over work time can be 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. Perceived FSSB has also been shown to increase resources in the form of work-family enrichment and in turn, improved performance outcomes over time in a study by Odle-Dusseau, Britt, and Greene-Shortridge (2012). 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 to the 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), where 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 above (Hammer, Kossek, Bodner & Crain, 2013; Hammer et al., 2011). The goal of the training was to teach supervisors FSSB, 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, Kossek, Zimmerman, & Daniels, 2007; Hochschild, 1997; Kossek, Ollier-Malaterre, Lee, Pichler, & Hall, in press). Recently scholars have identified these specific dimensions of supervisor support for family and personal life as potentially effective intervention targets (Hammer et al., 2009; Hammer et al., 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 and Bakker, 2012), increased FSSB can act as a critical workplace contextual resource that leads to increased perceptions of FSSB and reduce 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 increased OCBs (Bagger & Li, 2014). Additionally, it has been argued that making available work-life programs, 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 to the control group, employees in the facilities randomized to the intervention report higher levels of (a) safety compliance and (b) OCBs post-intervention.

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

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 the COR 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 which allows employees to structure their work and non-work 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 to 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).

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

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 conflict is 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 due to 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., Gaustello, 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 time and energy personal resources, 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 to the control group, employees in the intervention group will report lower levels of (a) work-to-family conflict, and (b) family-to-work conflict post-intervention.

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) discuss organizational change models based on Bandura's social-learning theory. Change (in this case, due to the intervention) may be more successful if there are pre-existing behavioral patterns which 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., in press). 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 as compared to 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, such that:

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 to 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 healthcare 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 healthcare 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.

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 1) 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 (lower retention rate being associated with worse working conditions) that could impact the success of the intervention; 2) the state in which the site was located, as nursing home regulations varied significantly by state; and 3) 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 “black out” 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 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 locations were unable to commit to 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 final 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 or more hours 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-minute 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 healthcare 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 healthcare 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 where

supervisors were asked to set goals and track behaviors using iPod touch devices that were pre-programmed and provided by the research team. This behavior tracking activity, aimed at increasing transfer of training, took just a couple minutes a day and lasted for two 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 healthcare employees at Leef.

The integrated STAR intervention was further customized for the healthcare industry we were studying. For example, workers in the healthcare industry experience erratic shifts due to 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 due to differences in the industry sectors (i.e., healthcare versus 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 eight hours 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 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 1-8%.

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.”

Organizational citizenship behaviors. 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?” and 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 $\alpha = .74$).

Family supportive supervisor behaviors. Family supportive supervisor behaviors (FSSB) were assessed at all three time points as employee perceptions of supervisors’ behavioral support for family and personal life. FSSB is distinct from general supervisor support, in that

some supervisors are supportive of employees doing their job, but not specifically of employees' family concerns. We used Hammer and colleagues' four-item short form measure (Hammer et al., 2013), 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 non-work" (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 versus control) by 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 condition by time wave means (e.g., see Table 2). As there are several ways to parameterize the same ANOVA model (e.g., indicator versus effects coding and a categorical versus continuous treatment of time), we briefly describe here our reasons for choosing the particular time wave model parameterization we used.

Insert Table 1 & 2 about here

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 post-intervention, 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 post-intervention time wave with baseline. Importantly, intervention effects in these models appear as intervention condition by 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) is used for these analyses using REML 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

¹ For example, with six condition by 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 post-intervention 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.

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 REML 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 above. In this parameterization, moderated intervention effects appear as three-way interactions (i.e., baseline moderator by intervention condition by 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 completed surveys, 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 $n=725$ in STAR group and $n=799$ 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 due to 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 conditions; Tables 5 and 6 provide significance tests for specific contrasts of these means.

Insert Tables 3 & 4 about here

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.

 Insert Table 5 about here

For safety compliance, a statistically significant STAR effect (i.e., Intervention by 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 by Wave interaction) was observed at 6 months, $\gamma = 0.05$, $t(56) = 1.56$, $p = .12$, $d = 0.09$; however, a

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.

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 Hypothesis 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 where 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.

Insert Table 6 about here

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 non-significant STAR effects indicate that the intervention did not ameliorate these declines.

Insert Figure 4 about here

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, $\gamma = -0.11$, $t(56) = -4.00$, $p < .001$.

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 non-significant 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 non-significant STAR effects indicate that the intervention did not improve upon these non-significant 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 2-7 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 by Wave by Baseline Moderator); baseline moderators were grand mean centered to aid in the interpretation of effects.

 Insert Table 7 about here

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 climate³ compared to 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 non-significant 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 SD 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 to 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 to lower baseline perceptions of work-family climate.

 Insert Figure 2 about here

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.

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 to lower baseline control over work time, as expected.

Insert Figure 3 about here

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 due to STAR in the lower-wage healthcare 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 due 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 perceptions of the work-family climate were higher, compared to when these baseline context conditions were lower.

Safety Compliance and Organizational Citizenship Behaviors

Results demonstrated that safety compliance significantly declined at the 6 and 12 month follow-ups compared to 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 healthcare industry where lives are at stake (Clark et al., 2014). Although we would like to assume that these protective effects were due to 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 healthcare workers in the current study (as described above and in 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 healthcare industry tends to be a highly regulated working environment which may have predisposed the intervention to be less effective compared to 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 to a professional workforce environment. While some of this was addressed in the customization of

STAR for healthcare, and we were well aware that increasing control over work time was going to be more challenging to implement in the healthcare industry compared to 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.

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, while 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, while 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 to 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 healthcare 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 due to 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 co-worker communication about work design leading to improved teamwork and safer practices). Given the failure to find significant mediational effects in this paper, 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.

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 to 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 & Future Directions

The present study is not without limitations, some of which were noted above, 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 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 healthcare industry, such as retail, transportation, or even construction. These issues considered, the healthcare 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 healthcare 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 sub-dimensions. With a broader multidimensional measure of work-family conflict (e.g., Carlson, Kacmar, & Williams, 2000), researchers could examine the roles played by each sub-dimension (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 due to 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 to 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., 2015 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.

References

- Allen, T. D. (2001). Family-supportive work environments: The role of organizational perceptions. *Journal of Vocational Behavior, 58*, 414-435. doi: 10.1006/jvbe.2000.1774
- Allen, T. D., Johnson, R. C., Kiburz, K. M., & Shockley, K. M. (2013). Work–family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology, 66*, 345-376. doi: 10.1111/peps.12012
- American Psychological Association. (2014). *Stress in America survey*. Retrieved from <http://www.apapracticecentral.org/update/2014/02-13/teen-stress.aspx>.
- Armenakis, A. A., & Bedeian, A. G. (1999). Organizational change: A review of theory and research in the 1990s. *Journal of Management, 25*, 293-315. doi:10.1016/s0149-2063(99)00004-5
- Bagger, J., & Li, A. (2014). How does supervisory family support influence employees' attitudes and behaviors? A social exchange perspective. *Journal of Management, 40*, 1123-1150.
- Beham, B. (2011). Work-family conflict and organizational citizenship behavior: Empirical evidence from Spanish employees. *Community, Work & Family, 14*, 63-80. doi: 10.1080/13668803.2010.506034
- Blair-Loy, M., & Wharton, A. S. (2002). Employees' use of work-family policies and the workplace social context. *Social Forces, 80*, 813-845. doi: 10.1353/sof.2002.0002
- Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 71-98). San Francisco: Jossey-Bass.
- Bragger, J. D., Rodriguez-Srednicki, O., Kutcher, E. J., Indovino, L., & Rosner, E. (2005). Work-family conflict, work-family culture, and organizational citizenship behavior

- among teachers. *Journal of Business and Psychology*, 20, 303-324. doi: 10.1007/s10869-005-8266-0
- Bray, J. W., Kelly, E. L., Hammer, L. B., Almeida D. M., Dearing, J. W., King. R. B., & Buxton, O. M. (2013). An integrative, multilevel, and transdisciplinary research approach to challenges of work, family, and health. RTI Press publication No. MR-0024-1302. Research Triangle Park, NC: RTI Press. Retrieved from <http://www.rti.org/rtipress>
- Brough, P., & O'Driscoll, M. P. (2010). Organizational interventions for balancing work and home demands: An overview. *Work & Stress*, 24, 280-297. doi: 10.1080/02678373.2010.506808
- Butts, M. M., Casper, W. J., & Yang, T. S. (2013). How important are work–family support policies? A meta-analytic investigation of their effects on employee outcomes. *Journal of Applied Psychology*, 98, 1-25. doi: 10.1037/a0030389
- Bureau of Labor Statistics (2014). *May 2013 National Occupational Employment and Wage Estimates, United States*. Retrieved from http://www.bls.gov/oes/current/oes_nat.htm
- Carlson, D. S., Kacmar, K. M., & Williams, L. J. (2000). Construction and initial validation of a multidimensional measure of work–family conflict. *Journal of Vocational Behavior*, 56, 249-276. doi: 10.1006/jvbe.1999.1713
- Clark, O. L., Zickar, M. J., & Jex, S. M. (2014). Role definition as a moderator of the relationship between safety climate and organizational citizenship behavior among hospital nurses. *Journal of Business and Psychology*, 29, 101-110. doi: 10.1007/s10869-013-9302-0
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310–357. doi:10.1037/0033-2909.98.2.310

- Cullen, J. C., & Hammer, L. B. (2007). Developing and testing a theoretical model linking work-family conflict to employee safety. *Journal of Occupational Health Psychology, 12*, 266-278. doi: [10.1037/1076-8998.12.3.266](https://doi.org/10.1037/1076-8998.12.3.266)
- Davis, K. D., Lawson, K., Almeida, D. M., Kelly, E., King, R. B., Hammer, L. Casper, L., Okechukwu, C., & Hanson, G., & McHale, S. M. (2015). Parents' daily time with their children: A workplace intervention. *Pediatrics, 135* (5), 875-882. doi: 10.1542/peds.2014-2057
- Donner, A., & Klar, N. (2004). Pitfalls of and controversies in cluster randomization trials. *American Journal of Public Health, 94*, 416-422. doi: 10.2105/AJPH.94.3.416
- Dunham, R. B., Pierce, J. L., & Castaneda, M. B. (1987). Alternative work schedules: Two field quasi-experiments. *Personnel Psychology, 40*, 215-242. doi: 10.1111/j.1744-6570.1987.tb00602.x
- Edwards, J. R., & Rothbard, N. P. (2000). Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review, 25*, 179-199. doi: 10.5465/AMR.2000.2791609
- Fox, S., Spector, P. E., & Miles, D. (2001). Counterproductive work behavior (CWB) in response to job stressors and organizational justice: Some mediator and moderator tests for autonomy and emotions. *Journal of Vocational Behavior, 59*, 291-309. doi: 10.1006/jvbe.2001.1803
- Frane, J. W. (1998). A method of biased coin randomization, its implementation, and its validation. *Drug Information Journal, 32*, 423-432. doi: 10.1177/009286159803200213

- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology, 92*, 1524-1541. doi: [10.1037/0021-9010.92.6.1524](https://doi.org/10.1037/0021-9010.92.6.1524)
- Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work-family conflict and strain. *Journal of Vocational Behavior, 54*, 350-370. doi: 10.1006/jvbe.1998.1666
- Greenhaus, J. H., & Beutell, N. J. (1985). Sources and conflict between work and family roles. *Academy of Management Review, 10*, 76-88. doi: 10.5465/AMR.1985.4277352
- Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology, 5*, 347-358. doi: [10.1037/1076-8998.5.3.347](https://doi.org/10.1037/1076-8998.5.3.347)
- Guastello, S. J., Gershon, R. R. M., & Murphy, L. R. (1999). Catastrophe model for the exposure to blood-borne pathogens and other accidents in health care settings. *Accident Analysis and Prevention, 31*, 739-749. doi: 10.1016/S0001-4575(99)00037-8
- Halbesleben, J. R. B. (2010). The role of exhaustion and workarounds in predicting occupational injuries: A cross-lagged panel study of health care professionals. *Journal of Occupational Health Psychology, 15*, 1-16. doi: [10.1037/a0017634](https://doi.org/10.1037/a0017634)
- Hammer, L. B., Demsky, C., Kossek, E. E., & Bray, J. (in press for a review). Work-family intervention research. To appear in T. D. Allen & L. T. Eby (Eds.), *Handbook of work and family*. Oxford.
- Hammer, L. B., Kossek, E. E., Anger, W. K., Bodner, T., & Zimmerman, K. L. (2011). Clarifying work-family intervention processes: The roles of work-family conflict and

- family-supportive supervisor behaviors. *Journal of Applied Psychology*, 96, 134-150. doi: [10.1037/a0020927](https://doi.org/10.1037/a0020927)
- Hammer, L. B., Kossek, E. E., Bodner, T., & Crain, T. (2013). Measurement development and validation of the family supportive supervisor behavior short-form (FSSB-SF). *Journal of Occupational Health Psychology*, 18, 285-296. doi: [10.1037/a0032612](https://doi.org/10.1037/a0032612)
- Hammer, L. B., Kossek, E. E., Yragui, N. L., Bodner, T. E., & Hanson, G. C. (2009). Development and validation of a multidimensional measure of family supportive supervisor behaviors (FSSB). *Journal of Management*, 35, 837-856. doi:10.1177/0149206308328510
- Hammer, L. B., Kossek, E. E., Zimmerman, K., & Daniels, R. (2007). Clarifying the construct of family-supportive supervisory behaviors (FSSB): A multilevel perspective. In P. L. Perrewe, & D. C. Ganster (Eds.), *Research in occupational stress and well-being* (pp. 6, 165-204). Bingley, UK: Emerald Group Publishing. doi: [10.1016/S1479-3555\(06\)06005-7](https://doi.org/10.1016/S1479-3555(06)06005-7)
- Hammer, L. B., & Sauter, S. L. (2013). Total worker health and work-life stress. *Journal of Environmental and Occupational Medicine*, 55, S25-S29. doi: 10.1097/JOM.0000000000000043
- Hammer, L. B., Van Dyck, S., & Ellis, A. (2013). Organizational policies supportive of work-life integration. In D. A. Major & R. Burke (Eds.), *Handbook of work-life integration among professionals: Challenges and opportunities* (pp. 288-309). Northampton, MA: Edward Elgar Publishing, Inc.

Henly, J. R., & Lambert, S. J. (2014). Unpredictable work timing in retail jobs: Implications for employee work–life conflict. *Industrial & Labor Relations Review*, *67*, 986-1016. doi: 10.1177/0019793914537458

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513-524. doi: [10.1037/0003-066X.44.3.513](https://doi.org/10.1037/0003-066X.44.3.513)

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, *50*, 337-421. doi: 10.1111/1464-0597.00062

Hobfoll, S. E., & Shirom, A. (2000). Conservation of resources theory: Applications to stress and management in the workplace. In R. T. Golembiewski (Ed.), *Handbook of organization behavior* (2nd rev. ed., pp. 57– 81). New York: Dekker.

Hochschild, A. (1997). *The time bind: When work becomes home and home becomes work*. New York: Metropolitan Books. doi: 10.1111/j.1743-4580.1997.tb00019.x

Judge, T. A., & Colquitt, J. A. (2004). Organizational justice and stress: The mediating role of work-family conflict. *Journal of Applied Psychology*, *89*, 395-404. doi: [10.1037/0021-9010.89.3.395](https://doi.org/10.1037/0021-9010.89.3.395)

Kalisch, B. J., Curley, M., & Stefanov, S. (2007). An intervention to enhance nursing staff teamwork and engagement. *The Journal of Nursing Administration*, *37*, 77–84. doi:10.1097/00005110-200702000-00010

Karasek, R. (1979). Job demands, job decision latitude and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*, 285-308. doi:10.2307/2392498

- Karasek, R., Baker, D., Marxer, F., Ahlbom, A., & Theorell, T. (1981). Job decision latitude, job demands, and cardiovascular disease: A prospective study of Swedish men. *American Journal of Public Health, 71*, 694-705. doi:10.2105/ajph.71.7.694
- Karasek, R., & Theorell, T. (1990). *Healthy work, stress, productivity, and the reconstruction of working life*. New York: Basic Books. doi:10.1016/0003-6870(92)90320-u
- Kelly, E., Kossek, E., Hammer, L., Durham, M., Bray, J., Chermack, K., Murphy, L., and Kaskubar, D. (2008). Getting there from here: Research on the effects of work-family initiatives on work-family conflict and business outcomes. *The Academy of Management Annals, 2*, 305-49. doi: 10.1080/19416520802211610
- Kelly, E. L., Moen, P., Oakes, J. M., Fan, W., Okechukwu, C., Davis, K. D., ... Casper, L. M. (2014). Changing work and work-family conflict: Evidence from the Work, Family, and Health Network. *American Sociological Review, 79*, 485-516. doi:10.1177/0003122414531435
- Kelly, E. L., Moen, P., & Tranby, E. (2011). Changing workplaces to reduce work-family conflict: Schedule control in a white-collar organization. *American Sociological Review, 76*, 265-290. doi:10.1177/0003122411400056
- King, R. B., Karuntzos, G., Casper, L. M., Moen, P., Davis, K. D., Berkman, L., ... Kossek, E. E. (2012). Work-family balance issues and work-leave policies. In R. J. Gatchel, & I. Z. Schultz (Eds.), *Handbook of occupational health and wellness* (pp. 323-339). New York, NY: Springer. doi: 10.1007/978-1-4614-4839-6_15
- Kossek, E. E. (2005). Workplace policies and practices to support work and families. In S. Bianchi, L. Casper, & R. King (Eds.), *Work, family, health, and well-being* (pp. 97-116). Hillsdale, NJ: Lawrence Erlbaum.

- Kossek, E. E., Colquitt, J. A., & Noe, R. A. (2001). Caregiving decisions, well-being, and performance: The effects of place and provider as a function of dependent type and work-family climates. *Academy of Management Journal*, *44*, 29-44. doi: 10.2307/3069335
- Kossek, E. E., Hammer, L. B., Kelly, E. L., & Moen, P. (2014). Designing work, family & health organizational change initiatives. *Organizational Dynamics*, *43*, 53-63. doi: 10.1016/j.orgdyn.2013.10.007
- Kossek, E., Lautsch, B., & Eaton, S. (2006). Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness. *Journal of Vocational Behavior*, *68*, 347-367. doi:10.1016/j.jvb.2005.07.002
- Kossek, E. E., & Ozeki, C. (1998). Work-family conflict, policies, and the job-life satisfaction relationship: A review and directions for organizational behavior-human resources research. *Journal of Applied Psychology*, *83*, 139-149. doi:10.1037/0021-9010.83.2.139
- Kossek, E. E., Ollier-Malaterre, A., Lee, M, Pichler, S. & Hall, D. (In press). Line managers' rationales for professionals' reduced-load work in embracing and ambivalent organizations. *Human Resource Management Journal*.
- Kossek, E. E., Pichler, S., Bodner, T., & Hammer, L. B. (2011). Workplace social support and work-family conflict: A meta-analysis clarifying the influence of general and work-family specific supervisor and organizational support. *Personnel Psychology*, *64*, 289-313. doi: 10.1111/j.1744-6570.2011.01211.x
- Lambert, S. J. (2000). Added benefits: The link between work-life benefits and organizational citizenship behavior. *Academy of Management Journal*, *43*, 801-815. doi: 10.2307/1556411

- LaMontagne, A. D., Keegel, T., Louie, A. M., Ostry, A., & Landsbergis, P. A. (2007). A systematic review of the job-stress intervention evaluation literature, 1990–2005. *International Journal of Occupational and Environmental Health, 13*, 268-280. doi: <http://dx.doi.org/10.1179/oeh.2007.13.3.268>
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc. doi: 10.4324/9780203809556
- Matos, K. & Galinsky, E. (2014). *2014 national study of employers*. Retrieved from <http://familiesandwork.org/downloads/2014NationalStudyOfEmployers.pdf>
- Mesmer-Magnus, J. R., & Viswesvaran, C. (2006). How family-friendly work environments affect work/family conflict: A meta-analytic examination. *Journal of Labor Research, 27*, 555-574. doi: 10.1007/s12122-006-1020-1
- McHale, S. M., Lawson, K. M., Davis, K. D., Casper, L., Kelly, E. L., & Buxton, O. (2015). Effects of a Workplace Intervention on Sleep in Employees' Children. *Journal of Adolescent Health, 56*, 672-677.
- Michel, J. S., Kotrba, L. M., Mitchelson, J. K., Clark, M. A., & Baltes, B. B. (2011). Antecedents of work–family conflict: A meta-analytic review. *Journal of Organizational Behavior, 32*, 689-725. doi: 10.1002/job.695
- Moen, P., Kelly, E. L., & Lam, J. (2013). Healthy work revisited: Do changes in time strain predict well-being? *Journal of Occupational Health Psychology, 18*, 157-72. doi: [10.1037/a0031804](http://dx.doi.org/10.1037/a0031804)
- Moen, P., Kelly, E. L., & Hill, R. (2011). Does enhancing work-time control and flexibility reduce turnover? A naturally occurring experiment. *Social Problems, 58*, 69–98. doi:10.1525/sp.2011.58.1.69

- Murray, D. M., Varnell, S. P., & Blitstein, J. L. (2004). Design and analysis of group-randomized trials: A review of recent methodological developments. *American Journal of Public Health, 94*, 423-432. doi: 10.2105/AJPH.94.3.423
- Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91*, 946-953. doi: [10.1037/0021-9010.91.4.946](https://doi.org/10.1037/0021-9010.91.4.946)
- Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science, 34*, 99-109. doi: 10.1016/S0925-7535(00)00008-4
- Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work-family conflict and family-work conflict scales. *Journal of Applied Psychology, 81*, 400-410. doi: [10.1037/0021-9010.81.4.400](https://doi.org/10.1037/0021-9010.81.4.400)
- Odle-Dusseau, H. N., Britt, T. W., & Greene-Shortridge, T. M. (2012). Organizational work-family resources as predictors of job performance and attitudes: The process of work-family conflict and enrichment. *Journal of Occupational Health Psychology, 17*, 28-40. doi:10.1037/a0026428
- Olson, R., Crain, T. L., Bodner, T. E., King, R., Hammer, L., Klein, L. C., ... Buxton, O. M. (2014). A workplace intervention improves sleep: Results from the randomized controlled Work, Family, and Health Study. *Sleep Health, 1*, 55-65. doi:10.1016/j.sleh.2014.11.003
- Olson, R., & Winchester, J. (2008). Behavioral self-monitoring of safety and productivity in the workplace: A methodological primer and quantitative literature review. *Journal of Organizational Behavior Management, 28*, 9-75. doi:10.1080/01608060802006823

- Skarlicki, D. P., & Latham, G. P. (1996). Increasing citizenship behavior within a labor union: A test of organizational justice theory. *Journal of Applied Psychology, 81*, 161-169.
doi: [10.1037/0021-9010.81.2.161](https://doi.org/10.1037/0021-9010.81.2.161)
- Skarlicki, D. P., & Latham, G. P. (1997). Leadership training in organizational justice to increase citizenship behavior within a labor union: A replication. *Personnel Psychology, 50*, 617-633. doi: 10.1111/j.1744-6570.1997.tb00707.x
- Smith, T. D., & DeJoy, D. M. (2012). Occupational injury in America: An analysis of risk factors using data from the general social survey (GSS). *Journal of Safety Research, 43*, 67-74. doi: 10.1016/j.jsr.2011.12.002
- ten Brummelhuis, L. L., & Bakker, A. B. (2012). A resource perspective on the work-home interface: The work-home resources model. *American Psychologist, 67*, 545-556.
doi:10.1037/a0027974
- Thomas, L. T., & Ganster, D. C. (1995). Impact of family-supportive work variables on work-family conflict and strain: A control perspective. *Journal of Applied Psychology, 80*, 6-15. doi: [10.1037/0021-9010.80.1.6](https://doi.org/10.1037/0021-9010.80.1.6)
- Thompson, R. C., Hilton, T. F., & Witt, L. A. (1998). Where the safety rubber meets the shop floor: A confirmatory model of management influence on workplace safety. *Journal of Safety Research, 29*, 15-24. doi: 10.1016/S0022-4375(97)00025-X
- Turner, N., Hershcovis, M. S., Reich, T. C., & Totterdell, P. (2014). Work-family interference, psychological distress, and workplace injuries. *Journal of Occupational and Organizational Psychology, 87*, 715-732. doi: 10.1111/joop.12071

- Varnell, S. P., Murray, D. M., Janega, J. B., & Blitstein, J. L. (2004). Design and analysis of group-randomized trials: A review of recent practices. *American Journal of Public Health, 94*, 393-399. doi: 10.2105/AJPH.94.3.393
- Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology, 90*, 616-628. doi: [10.1037/0021-9010.90.4.616](https://doi.org/10.1037/0021-9010.90.4.616)
- Zohar, D. & Luria, G. (2003). The use of supervisory practices as leverage to improve safety behavior: A cross-level intervention model. *Journal of Safety Research, 34*, 567-577. doi: 10.1016/j.jsr.2003.05.006
- Zohar, D., & Polachek, T. (2014). Discourse-based intervention for modifying supervisory communication as leverage for safety climate and performance improvement: A randomized field study. *Journal of Applied Psychology, 99*, 113-124. doi: [10.1037/a0034096](https://doi.org/10.1037/a0034096)

Table 1

Estimated Variance Components and Intraclass correlations for Study variables at the Location, Employee, and Within Employee Levels

| Variable | Estimated Variance Components | | | ICC | ICC |
|--|-------------------------------|----------------|-----------------------|------------|------------|
| | Location Level | Employee Level | Within Employee Level | (Location) | (Employee) |
| Organizational Citizenship Behaviors | 0.00 | 0.18* | 0.16* | 0.00 | 0.53 |
| Safety Compliance | 0.00 | 0.11* | 0.13* | 0.01 | 0.46 |
| Work-to-Family Conflict | 0.01* | 0.47* | 0.32* | 0.03 | 0.60 |
| Family-to-Work Conflict | 0.00* | 0.14* | 0.17* | 0.02 | 0.46 |
| Family Supportive Supervisor Behaviors | 0.02* | 0.34* | 0.39* | 0.06 | 0.47 |
| Control Over Work Time | 0.03* | 0.27* | 0.26* | 0.11 | 0.51 |
| Work-Family Climate | 0.02* | 0.34* | 0.35* | 0.04 | 0.49 |

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

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

| | Control Group (<i>N</i> = 798-799) | Intervention Group (<i>N</i> = 724-725) |
|---|--|---|
| Age (<i>M, SD</i>) | 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 | 0.40 | 0.10 |
| Black or African American, Non-Hispanic | 12.90 | 15.00 |
| Asian Indian | 0.40 | 0.40 |
| Other Asian | 3.10 | 2.30 |
| Other Pacific Islander | 0.50 | 0.10 |
| Hispanic | 14.50 | 11.20 |
| More Than One Race | 2.50 | 3.30 |
| Other | 0.00 | 0.10 |
| Married/Cohabiting (%) | 64.80 | 60.70 |
| Children at Home (%) | 57.60 | 53.50 |
| Number of Children (<i>M, SD</i>) | 1.07, 1.16 | 0.99, 1.17 |
| Eldercare (%) | 27.90 | 32.40 |
| Hours of Work Per Week (<i>M, SD</i>) | 37.32, 7.64 | 36.46, 6.70 |
| Tenure in Years (<i>M, SD</i>) | 6.37, 6.66 | 6.13, 6.33 |

Table 4

Descriptives and Correlations of Study Variables

| | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|----------|-----------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1. Intervention | .48 | .50 | — | | | | | | | | |
| 2. Baseline Organizational Citizenship Behaviors | 4.12 | .57 | -.04 | — | | | | | | | |
| 3. 6m Organizational Citizenship Behaviors | 4.04 | .56 | .00 | .53** | — | | | | | | |
| 4. 12m Organizational Citizenship Behaviors | 4.00 | .58 | .05 | .50** | .63** | — | | | | | |
| 5. Baseline Safety Compliance | 4.50 | .49 | .03 | .19** | .18** | .15** | — | | | | |
| 6. 6m Safety Compliance | 4.45 | .51 | .08** | .16** | .21** | .21** | .42** | — | | | |
| 7. 12m 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. 6m Work-to-Family Conflict | 2.77 | .89 | .06* | -.02 | .02 | .03 | -.00 | -.03 | -.03 | .59** | — |
| 10. 12m 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** |
| 12. 6m Family-to-Work Conflict | 2.09 | .55 | .03 | -.06* | -.07* | -.01 | -.17** | -.13** | -.13** | .28** | .42** |
| 13. 12m Family-to-Work Conflict | 2.07 | .55 | .03 | -.06* | -.10** | -.11** | -.20** | -.16** | -.17** | .26** | .31** |
| 14. Baseline Control Over Work Time | 2.65 | .73 | .09** | .00 | .01 | .01 | .08** | .07* | .08* | -.20** | -.13** |
| 15. 6m Control Over Work Time | 2.60 | .75 | -.01 | .02 | .03 | .02 | .09** | .09** | .09** | -.16** | -.25** |
| 16. 12m Control Over Work Time | 2.64 | .77 | .01 | .01 | .02 | .03 | .07* | .06* | .10** | -.21** | -.21** |
| 17. Baseline Family Supportive Supervisor Behavior | 3.69 | .88 | -.03 | .05* | .06* | .06 | .14** | .12** | .11** | -.22** | -.17** |
| 18. 6m Family Supportive Supervisor Behavior | 3.62 | .88 | .00 | .04 | .09** | .04 | .07** | .09** | .09** | -.14** | -.23** |
| 19. 12m Family Supportive Supervisor Behavior | 3.65 | .84 | .02 | .01 | .05 | .02 | .08* | .09** | .07* | -.18** | -.20** |
| 20. Baseline Work-Family Climate | 2.88 | .83 | .04 | -.08** | -.07* | -.06 | -.02 | -.01 | .01 | -.34** | -.21** |

Note. $N = 1044-1521$. 6m = 6 months; 12m = 12 months.

Intervention: 1 = intervention, 0 = control.

* $p < .05$. ** $p < .01$.

Table 4, cont.

Descriptives and Correlations of Study Variables

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|--|--------|--------|--------|--------|-------|-------|-------|-------|-------|-----|
| 1. Intervention | | | | | | | | | | |
| 2. Baseline Organizational Citizenship Behaviors | | | | | | | | | | |
| 3. 6m Organizational Citizenship Behaviors | | | | | | | | | | |
| 4. 12m Organizational Citizenship Behaviors | | | | | | | | | | |
| 5. Baseline Safety Compliance | | | | | | | | | | |
| 6. 6m Safety Compliance | | | | | | | | | | |
| 7. 12m Safety Compliance | | | | | | | | | | |
| 8. Baseline Work-to-Family Conflict | | | | | | | | | | |
| 9. 6m Work-to-Family Conflict | | | | | | | | | | |
| 10. 12m Work-to-Family Conflict | — | | | | | | | | | |
| 11. Baseline Family-to-Work Conflict | .26** | — | | | | | | | | |
| 12. 6m Family-to-Work Conflict | .31** | .46** | — | | | | | | | |
| 13. 12m Family-to-Work Conflict | .43** | .41** | .49** | — | | | | | | |
| 14. Baseline Control Over Work Time | -.16** | -.09** | -.07* | -.10** | — | | | | | |
| 15. 6m Control Over Work Time | -.24** | -.07* | -.08** | -.12** | .51** | — | | | | |
| 16. 12m Control Over Work Time | -.26** | -.10** | -.09** | -.11** | .52** | .62** | — | | | |
| 17. Baseline Family Supportive Supervisor Behavior | -.18** | -.11** | -.07** | -.12** | .21** | .18** | .15** | — | | |
| 18. 6m Family Supportive Supervisor Behavior | -.23** | -.05 | -.07* | -.13** | .17** | .25** | .20** | .51** | — | |
| 19. 12m Family Supportive Supervisor Behavior | -.25** | -.11** | -.10** | -.15** | .16** | .18** | .19** | .42** | .57** | — |
| 20. Baseline Work-Family Climate | -.20** | -.17** | -.13** | -.10** | .19** | .13** | .21** | .10** | .08** | .10 |

Note. $N = 1044-1521$. 6m = 6 months; 12m = 12 months.

Intervention: 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.

| Fixed Effects | DV: Safety Compliance | | DV: Organizational Citizenship Behaviors | |
|---|-----------------------|-------|--|-------|
| | Estimate | SE | Estimate | SE |
| Intercept | 4.48* | 0.020 | 4.14* | 0.020 |
| Intervention (at Baseline) | 0.02 | 0.030 | -0.04 | 0.029 |
| 6 Month Wave (in Control Facilities) | -0.06* | 0.020 | -0.11* | 0.020 |
| 12 Month Wave (in Control Facilities) | -0.09* | 0.021 | -0.17* | 0.022 |
| Intervention * 6 Month Wave (6 Month Intervention Effect) | 0.06* | 0.029 | 0.05 | 0.030 |
| Intervention * 12 Month Wave (12 Month Intervention Effect) | 0.04 | 0.030 | 0.09* | 0.032 |
| Random Effects | Estimate | SE | Estimate | SE |
| Residual | 0.14* | 0.004 | 0.15* | 0.004 |
| CS Covariance | 0.11* | 0.006 | 0.18* | 0.009 |
| Location Intercept Variance | 0.002 | 0.001 | NE | NE |

Note. * $p < .05$. CS = Compound Symmetric. Intervention coded: 1 = Intervention, 0 = Control; 6 Month Wave coded: 1 = 6 Month Wave, 0 = Other; 12 Month Wave coded: 1 = 12 Month Wave, 0 = Other. NE = Not estimable due to lack of variability in estimated intercepts across facilities conditional on the other effects in the model.

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 | |
| Fixed Effects | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE |
| Intercept | 3.72* | 0.053 | 2.60* | 0.054 | 2.76* | 0.042 | 2.05* | 0.027 |
| Intervention (at Baseline) | -0.05 | 0.076 | 0.14 | 0.076 | 0.08 | 0.060 | 0.05 | 0.039 |
| 6 Month Wave (in Control Facilities) | -0.10* | 0.033 | 0.01 | 0.027 | -0.03 | 0.030 | 0.02 | 0.022 |
| 12 Month Wave (in Control Facilities) | -0.11* | 0.034 | 0.02 | 0.028 | -0.10* | 0.032 | 0.02 | 0.023 |
| Intervention * 6 Month Wave (6 Month Intervention Effect) | 0.07 | 0.048 | -0.12* | 0.039 | 0.03 | 0.044 | -0.02 | 0.032 |
| Intervention * 12 Month Wave (12 Month Intervention Effect) | 0.09 | 0.050 | -0.08 | 0.042 | 0.05 | 0.047 | -0.01 | 0.034 |
| Random Effects | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE |
| Residual | 0.37* | 0.011 | 0.25* | 0.007 | 0.32* | 0.009 | 0.17* | 0.005 |
| CS Covariance | 0.36* | 0.020 | 0.27* | 0.014 | 0.47* | 0.023 | 0.14* | 0.008 |
| Location Intercept Variance | 0.03* | 0.011 | 0.03* | 0.011 | 0.01* | 0.006 | 0.01* | 0.002 |

Note. * $p < .05$. CS = Compound Symmetric. Intervention coded: 1 = Intervention, 0 = Control; 6 Month Wave coded: 1 = 6 Month Wave, 0 = Other; 12 Month Wave coded: 1 = 12 Month Wave, 0 = Other.

Table 7

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

| Fixed Effects | 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 |
| Intercept | 4.48* | 0.020 | 4.48* | 0.021 | 4.15* | 0.020 |
| Intervention (at Baseline at Moderator Mean) | 0.03 | 0.029 | 0.03 | 0.030 | -0.04 | 0.030 |
| 6 Month Wave (in Control Facilities at Moderator Mean) | -0.06* | 0.020 | -0.06* | 0.020 | -0.11* | 0.021 |
| 12 Month Wave (in Control Facilities at Moderator Mean) | -0.09* | 0.021 | -0.09* | 0.021 | -0.17* | 0.022 |
| Intervention * 6 Month Wave (6 Month Intervention Effect at Moderator Mean) | 0.06* | 0.029 | 0.06* | 0.028 | 0.05 | 0.030 |
| Intervention * 12 Month Wave (12 Month Intervention Effect at Moderator Mean) | 0.04 | 0.030 | 0.04 | 0.030 | 0.09* | 0.032 |
| Moderator (at Baseline in Control Facilities) | 0.10* | 0.020 | 0.02 | 0.022 | 0.01 | 0.028 |
| Moderator * Intervention (at Baseline) | -0.04 | 0.029 | -0.06 | 0.031 | -0.01 | 0.040 |
| Moderator * 6 Month Wave (in Control Facilities) | -0.04 | 0.023 | 0.00 | 0.024 | -0.02 | 0.029 |
| Moderator * 12 Month Wave (in Control Facilities) | -0.04 | 0.024 | -0.04 | 0.026 | -0.05 | 0.030 |
| Moderator * Intervention * 6 Month Wave (6 Month Moderated Intervention Effect) | 0.08* | 0.033 | -0.00 | 0.035 | 0.05 | 0.042 |
| Moderator * Intervention * 12 Month Wave (12 Month Moderated Intervention Effect) | 0.05 | 0.035 | 0.08* | 0.037 | 0.11* | 0.044 |
| Random Effects | Estimate | SE | Estimate | SE | Estimate | SE |
| Residual | 0.13* | 0.004 | 0.13* | 0.004 | 0.15* | 0.004 |
| CS Covariance | 0.11* | 0.006 | 0.11* | 0.006 | 0.18* | 0.009 |
| Location Intercept Variance | 0.00 | 0.001 | 0.00 | 0.001 | NE | NE |

Note. * $p < .05$. Moderators are grand-mean centered. Intervention coded: 1 = Intervention, 0 = Control; 6 Month Wave coded: 1 = 6 Month Wave, 0 = Other; 12 Month Wave coded: 1 = 12 Month Wave, 0 = Other. NE = Not estimable due to lack of variability in estimated intercepts across facilities conditional on the other effects in the model.

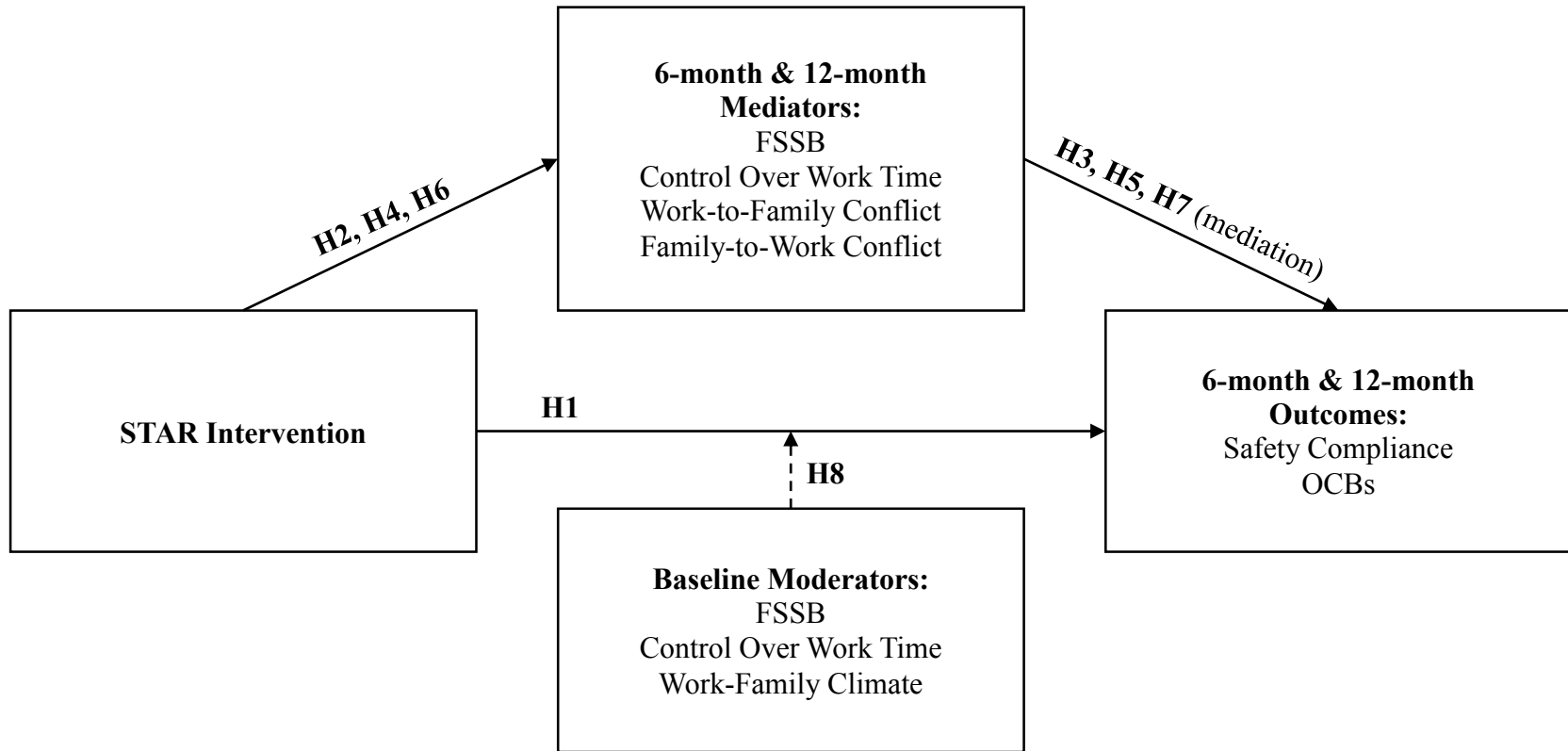


Figure 1. Theoretical model linking STAR to organizational outcomes.

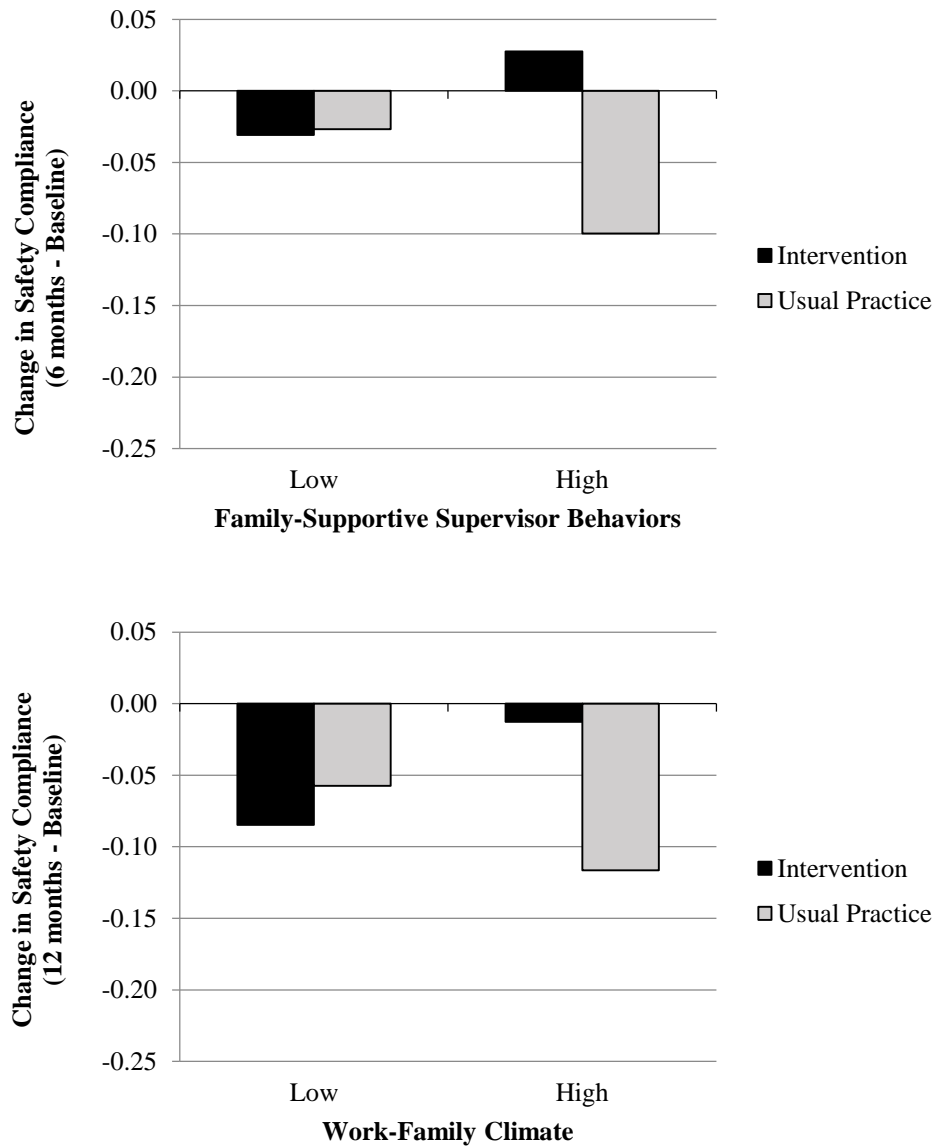


Figure 2. Change in safety compliance over time across intervention conditions as moderated by baseline family supportive supervisor behavior (FSSB) ratings (top) and baseline perceptions of work-family climate ratings (bottom). (High and low moderator variable values defined as ± 1 SD from baseline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

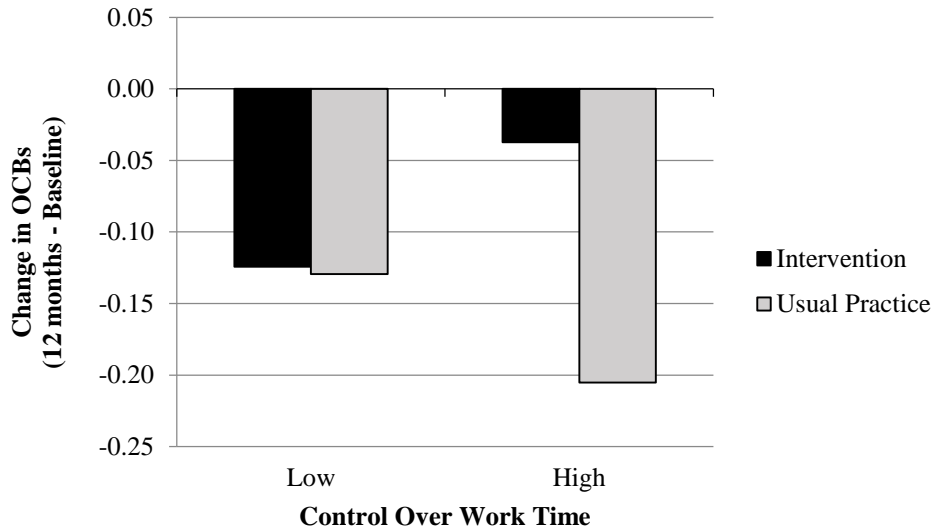


Figure 3. Change in organizational citizenship behaviors (OCBs) over time across intervention conditions as moderated by baseline control over work time ratings. (High and low moderator variable values defined as ± 1 SD from baseline mean value.)

Online Appendix
 Summary of Intervention Activities and Sample Timeline

For the specific STAR Workplace Change Toolkit go to www.workfamilyhealthnetwork.org

The *STAR: Health Care* implementation will help managers shift their attitudes and behaviors about the rules and regulations that have operated in health care settings for decades. Together, we will help them overcome antiquated rules around scheduled time, beliefs, and workplace language, thus positioning them to more effectively create a patient-centered environment. Managers who should participate in STAR include administrators, facility managers, human resource managers, schedulers, team supervisors, and night-shift supervisors.

Our process is not the typical “teach and train” program involving all-day seminars, workbooks, and tests. STAR implementation consists of a series of experiential sessions. Between sessions, employees and managers work on specific activities that will enable them to change their behaviors and emotions to evolve to a patient-centered environment that is also supportive of employees’ work and life needs.

Sample Timeline:

| Sessions/Activity | Participants | Time | Rollout | Sessions/Activity | Participants | Time | Rollout |
|--|--------------------------|-----------|-------------|--|---------------|-----------|-------------|
| STAR Steering Team Session #1 & Manager-Only Session | Steering Team & Managers | 3 hours | Week 1 | STAR Steering Team Session #2 & Manager-Only Session | Steering Team | 3 hours | Week 7 |
| Team Induction/ Sludge | All | 1.5 hours | Week 1 | Culture Clinic | All | 1.5 hours | Week 7 |
| weSupport Training and Behavior Tracking | Managers | 2 weeks | Weeks 2 & 3 | weSupport Behavior Tracking (#2) | Managers | 2 weeks | Weeks 8 & 9 |
| Sludge Eradication Activity | All | 2 weeks | Weeks 2 & 3 | Do Something Different Activity | All | 2 weeks | Weeks 8 & 9 |
| | | | | Forum | All | 1 hour | Week 12 |

| YEAR (SAMPLE) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----|----|----|----|----|----|-------|----|----|----|----|----|----|-----|----|----|----|----|----|----|------|----|----|----|----|----|----|
| March | | | | | | | April | | | | | | | May | | | | | | | June | | | | | | |
| S | M | T | W | TH | F | S | S | M | T | W | TH | F | S | S | M | T | W | TH | F | S | S | M | T | W | TH | F | S |
| | | 1 | 2 | 3 | 4 | 5 | | | | | | 1 | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | 1 | 2 | 3 | 4 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 27 | 28 | 29 | 30 | 31 | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 29 | 30 | 31 | | | | | 26 | 27 | 28 | 29 | 30 | | |

The STAR Implementation Process consists of the following phases:

Phase 1: Prepare for the Change

Outcome: Facilitators learn the unique aspects of COMPANY'S culture that will maximize session interactions with employees. The health care facility's management team is prepared to effectively guide their center into a STAR workplace.

Steering Team Session #1

All Steering Team Members: The STAR facilitator will spend about **20 minutes** talking with all Steering Team members, giving a brief overview of what to expect over the next few months. Steering Team members will receive specific instructions on how to incorporate STAR into their workplace in practical ways and how to be peer leaders for STAR.

Managers Only: After the initial introduction, managers will first spend **1.5 hours** going through the principles of STAR, what it is, and why it is important. This session will also introduce the concept of Sludge and Sludge Eradication. This is followed by a **one-hour** interactive education session in which the Management Team will be exposed to the STAR philosophy and business case. Because it is their attitudes and behaviors that will set the tone for success, it is critical that the Management Team take this time to understand and prepare for their role in creating a supportive environment during and after this adaptive change process.

weSupport Training: Managers and supervisors will complete a computer-based training that will provide them with information about the relationship between work and non-work and how this relationship can impact their own well-being and performance, as well as that of their employees.

weSupport Behavior Tracking (#1): The *weSupport* Tracking exercise helps managers and supervisors examine the ways they provide family and performance support to the people they supervise. This type of behavior tracking helps people become more aware of their actions versus their intentions. The exercise will help managers work toward the goal of becoming more supportive. Family-supportive and performance-supportive behaviors are tracked using an iPod Touch device.

Phase 2: Set the Change in Motion

Outcome: The employees have the tools and framework necessary to begin operating in a STAR workplace.

Team Induction/Sludge Session (1.5 hours): In this session, participants will learn all about STAR: what it is, how it works, and why it is important for their care facility and COMPANY. Managers and employees take the principles and STAR Guideposts learned in Team Induction and make the connection between actual behaviors at home and at work that reduce work/family conflict and create a supportive work environment. Participants learn about “**Sludge**” – a divisive force that seeks to maintain order and hierarchy associated with outdated workplace rules and norms. Employees learn to recognize and identify different types of Sludge and develop strategies for eradicating Sludge from their workplace.

Sludge Eradication Activity: Employee activities will help people apply what they have learned in their actual work environment. After the Sludge session, employees will spend two weeks in the first group activity focused on eradicating Sludge. Employees will record each time they use the “Sludge Eradication Strategy,” which is a planned positive response to hearing Sludge. Team members work together to eliminate Sludge from the work environment.

Steering Team Session #2:

All Steering Team Members: Similar to the first Steering Team meeting, the facilitator will spend 20 minutes with the entire Steering Team reviewing the STAR process to this point, checking on progress, and addressing questions and concerns.

Managers Only: Managers will spend the 1.5 hours discussing how to create a STAR workplace. This includes content about operating effectively within a counter-culture environment, resisting implementation of traditional guidelines within the counter-culture, and solidifying feelings as part of this new work environment. An additional hour is necessary to prepare managers to support their employees in a STAR workplace prior to “Go Live.” The session includes on-the-spot coaching, confidence-building situational role plays, and a review of management behaviors necessary to provide performance and personal/family support in the STAR workplace, as well as feedback on the results of their *weSupport* Tracking exercise.

Culture Clinic (1.5 hours): In these interactive sessions, participants continue their education and will learn how to: (1) Operate effectively within a counter-culture environment, (2) Resist implementing traditional guidelines within the counter-culture, (3) Solidify their feelings as part of the new work environment. At the end of the sessions, employees have the **framework** they need to begin operating in a STAR workplace.

Go Live! Immediately following the Culture Clinic session, employees begin operating in a STAR environment by solving workplace issues. Allowing employees to manage through ambiguity during Phase 3 has proven to be critical to the adoption of behaviors that will create a results-only focus.

Do Something Different Activity: This second employee activity helps people apply what they have learned in training in their actual work environment. After the Culture Clinic, employees will spend two weeks in the second group activity focused on Doing Something Different. Employees will track new things they have done to better support their co-workers or to take better control over work time.

***weSupport* Behavior Tracking (#2):** The second behavior tracking exercise allows managers and supervisors to apply what they’ve learned about what it means to be a supportive manager as they’ve migrated through the STAR process and compare that progress to the first trial of the *weSupport* Tracking. Tracking the behaviors allows for feedback on progress toward personal supervisor goals. At the end of the STAR sessions, supervisors can also receive individualized

feedback that compares their progress to all the managers and supervisors as a group (depending on the version of *weSupport* your company has selected).

Phase 3: Learn and Evolve

Outcome: Employees will report increased job satisfaction, reduced stress, improved morale, and the ability to manage work and life more effectively. Managers will report a shift in their ability to support employees to more effectively create a patient-centered environment.

Forum Sessions (1 hour): Employees and managers come back together to share wins and challenges that they are experiencing in a STAR environment about 4–6 weeks after Go Live. At these forums, facilitators provide on-the-spot coaching and encouragement to keep managers and employees focused. Robust discussions keep old beliefs and behaviors from creeping back in.

Data Transparency Table

This original data set was collected as part of a federally-funded multi-site randomized controlled trial that took place in two different industries. The present manuscript is based on data from the healthcare industry that have not yet been published. The principal investigators involved formed a publication committee that reviews all manuscripts and the data are not currently available to the public. The publication committee reviews all proposed manuscripts to eliminate overlap in manuscripts and to parcel out the independent effects of the intervention. This is the first intervention effects paper based on the health care industry sample, and thus no other papers have been published testing the intervention effects on the outcomes presented in the current manuscript.

Given the large-scale multi-wave nature of the project, more general findings from the data collection are being reported in several under-review and in-progress manuscripts in a variety of academic disciplines (MS #2-6). The table below displays which variables appear in each study, as well as the current status of each study. The overlapping manuscripts include analyses evaluating the intervention's effect on identical mediators (MS #3) and/or include the same baseline moderators or control variables (MS #2-6). However, all overlapping manuscripts ultimately evaluate intervention effects on unique outcomes not included in the current manuscript (e.g., adolescent health, customer satisfaction). Any manuscripts assessing intervention effects on identical mediators are under embargo until the current manuscript is published.

| Variables in Complete Dataset | MS 1 (STATUS= current ms) | MS 2 (STATUS= under review) | MS 3 (STATUS= in progress) | MS 4 (STATUS= under review) | MS 5 (STATUS= under review) | MS 6 (STATUS= under review) |
|-------------------------------|---------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. Treatment | X | | X | | | |
| 2. Baseline OCBs | X | | | | | |
| 3. 6m OCBs | X | | | | | |
| 4. 12m OCBs | X | | | | | |
| 5. Baseline Safety Compliance | X | | | | | |
| 6. 6m Safety Compliance | X | | | | | |
| 7. 12m Safety Compliance | X | | | | | |
| 8. Baseline WTFC | X | X | X | | X | X |
| 9. 6m WTFC | X | | X | | | |
| 10. 12m WTFC | X | | X | | | |
| 11. Baseline FTWC | X | X | X | | X | |
| 12. 6m FTWC | X | | X | | | |
| 13. 12m FTWC | X | | X | | | |
| 14. Baseline CWT | X | X | X | X | | |
| 15. 6m CWT | X | | | | | |
| 16. 12m CWT | X | | X | | | |
| 17. Baseline FSSB | X | X | X | | X | |
| 18. 6m FSSB | X | | | | | |
| 19. 12m FSSB | X | | X | | | |
| 20. Baseline WF Climate | X | | X | | | |