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## Effects of a Workplace Intervention on Daily Stressor Reactivity

Kate A. Leger<sup>1</sup>, Soomi Lee<sup>2</sup>, Kelly D. Chandler<sup>3</sup>, David M. Almeida<sup>4</sup>

<sup>1</sup>Department of Psychology, University of Kentucky

<sup>2</sup>School of Aging Studies, University of South Florida

<sup>3</sup>Department of Human Development and Family Sciences, Oregon State University

<sup>4</sup>Department of Human Development and Family Studies, The Pennsylvania State University

### Abstract

Heightened affective and physical reactions to daily stressful events predict poor long-term physical and mental health outcomes. It is unknown, however, if an experimental manipulation designed to increase interpersonal resources at work can reduce associations between daily stressors and physical and affective well-being. The current study tests the effects of a workplace intervention designed to increase supervisor support for family and personal life and schedule control on employees' affective and physical reactivity to daily stressors in different domains (i.e., work, home, interpersonal, and non-interpersonal stressors). Participants were 102 employed parents with adolescent children from an information technology division of a large US firm who participated in the Work, Family, and Health Study. Participants provided eight-day daily diary data at baseline and again at a 12-month follow-up after the implementation of a workplace intervention. Multilevel models revealed that the intervention significantly reduced employees' negative affect reactivity to work stressors and non-interpersonal stressors, compared to the usual practice condition. Negative reactivity did not decrease for non-work or interpersonal stressors. The intervention also did not significantly reduce positive affect reactivity or physical symptom reactivity to any stressor type. Results demonstrate that making positive changes in work environments, including increasing supervisor support and flexible scheduling, may promote employee health and well-being through better affective responses to common daily stressors at work.

### Keywords

daily stress; workplace intervention; negative affect; stressor reactivity; physical symptoms

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The negative impact of daily stressors on worker well-being has been well-established in the literature. Job demands, interpersonal conflict, and work interfering with non-work activities are frequent stressors that have negative consequences on workers' health and well-being (de Raeve et al., 2009; Schaufeli & Taris, 2014). In particular, interpersonal stressors at work,

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Correspondence concerning this article should be addressed to Kate Leger, Department of Psychology, The University of Kentucky 106-B Kastle Hall, Lexington, KY 40506, United States; kate.leger@uky.edu, +1 (763) 439-7772.

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such as having conflicts with supervisors or getting into arguments with coworkers about work assignments, are a frequent source of stress for many workers (de Raeve et al., 2009; Sulsky & Wright et al., 2014). Increasing interpersonal and structural resources at work, such as increased supervisor support for family life and control over work schedules, may help workers be less reactive to daily stressful events at work. Additionally, increasing these resources at work may also be beneficial for helping workers adapt to non-work stressors in daily life that are mostly interpersonal in nature. For example, having supervisor support for family life may help reduce reactivity to conflicts with a spouse at home. Increasing resources at work may help workers be less reactive to daily stressors both at work and at home, because resources across contexts may accumulate together to create resource gain spirals in employees (Hakanen et al., 2008; Hobfoll 2012). In turn, these resource gain spirals may lead to reduced reactivity to daily stressful events, and may eventually have long-term health consequences, as individuals who are highly reactive to daily stressors are more likely to have adverse health outcomes over time (Piazza et al., 2019). Supervisor support and schedule control have been shown to be beneficial to employee health and well-being, but it is unknown if experimental manipulation of these resources can reduce employees' affective and physical reactivity to daily stressors.

The current study examines this question with a workplace intervention designed to increase supervisor support and schedule control (Kelly et al., 2014). This study provides a unique opportunity to examine how the increase of interpersonal and structural resources at work has an impact on employees' ability to regulate affective and physical responses to daily stressful events at and outside of work. This study contributes to both the literature on work-related interpersonal stress and the demands-resources literature by using daily stress processes as a window into both nonwork and work-related stress, as well as stressors that are interpersonal in nature.

## Daily Stressor Reactivity and Health

Daily stressful experiences, such as interpersonal conflicts or work deadlines, are common in everyday life and impact physical and mental well-being. People report higher levels of negative affect, lower levels of positive affect, and greater numbers of physical symptoms on days when a stressor occurs, termed stressor reactivity (Bolger & Schilling, 1991; Charles & Almeida, 2006). The operational definition of stressor reactivity is the within-person relationship between stressors and internal biological and psychological states (Almeida, 2005). Mounting evidence suggests that individuals differ in their reactivity to daily stressors, with some people being more reactive to stressors than others. These individual differences in stressor reactivity have important implications for physical and mental health (Epel et al., 2018). People with heightened reactivity to daily stressors (i.e., greater increases in negative affect and physical symptoms or decreases in positive affect on days with stressors) are at increased risk for developing mental disorders (Charles et al., 2013), physiological dysregulation (Piazza et al., 2019; Sin et al., 2016), medical conditions (Piazza et al., 2013), and even early mortality (Chiang et al., 2018; Mroczek et al., 2015).

Associations between stressor reactivity and health and well-being may vary depending on stressor domain. Previous studies have made distinctions between commonly reported

stressors such as stressors experienced at work and stressors experienced at home (Grzywacz et al., 2002; Serido et al., 2004). Studies have also examined differences in interpersonal stressors, or stressors characterized by interactions with coworkers, family members, or acquaintances, as well as non-interpersonal stressors, or stressors that do not involve interactions with another person, such as job demands or work deadlines (e.g., Birditt et al., 2005). Interpersonal stressors are particularly important to examine because they have a stronger negative association with daily well-being than other stressors (Neupert et al., 2007). Given robust links between reactions to daily stressors and long-term health, it is important to examine factors that may reduce reactivity to daily stressors in various domains.

## The Workplace, Stress, and Well-being: Resource Gain Spirals

The work-family interface is a primary context for understanding daily stress processes. Changes to both the nature of work and family structure have increased the demands of both work and nonwork roles for the average American. Technological advances and globalization have changed the nature of work, promoting longer hours and making disengaging from work more difficult. Over 50% of working parents report difficulty balancing work and family responsibilities (Pew Research Center, 2015). Daily stressful events at work, such as daily job demands, interpersonal conflict, and work interfering with non-work activities are highly prevalent. They have been associated with health-related outcomes in workers, including poor sleep quality, burnout, and depression (de Raeve et al., 2008; Frone, 2000; Nakata et al., 2004), as well as organizational outcomes, such as job dissatisfaction, intention to quit, and work disability (Appelberg et al., 1996; Harvey et al., 2006).

An increase in interpersonal and structural work resources, such as increased supervisor support for family life and control over a work schedule, may help individuals cope with stressful events in both work and nonwork domains. The conservation of resources (COR) theory posits that individuals can continuously accumulate resources, as existing resources assist in acquiring new resources, which begets other resources, and so on. These “gain spirals” allow workers to use specific available resources to invest in the accumulation of greater general resources that impact outcomes in a variety of domains and enhances their well-being (Hobfoll, 2001). Increases in personal resources makes it easier for individuals to regulate emotions and cope with daily stressful events (Lazarus & Folkman, 1984). Perceptions and use of resources are important for individuals coping with competing demands from both work and home environments (ten Brummelhuis & Bakker, 2012). For example, the benefits of social support in dealing with stressors have been well-documented (Cohen & Wills, 1985), and supervisor support is an important factor in helping employees balance work and family roles (Glass & Finley, 2002). Family-supportive supervisor behaviors (FSSB), specifically, have immense benefits for employee health (Hammer, Kossek, Anger, Bodner, & Zimmerman, 2011). Supervisors who engage in more FSSB empathize with an employee’s desire to manage work and family responsibilities effectively while engaging in emotional support, instrumental support, role-modeling behaviors, and creative work–family management practices (Hammer, Kossek, Yragui, Bodner, & Hanson, 2009). Additionally, having control and flexibility over a workplace schedule is a valuable resource for workers. Schedule control allows workers to coordinate the responsibilities

of their job with responsibilities outside of work. Schedule control is posited to reduce exposure to stressors because workers are better able to organize their daily lives in ways that minimize conflicts between work and family (Casey & Grzywacz, 2008). For example, Almeida and Davis (2011) found that employed parents with low workplace flexibility were more emotionally and physically reactive to work stressors. Increasing resources through a workplace intervention may facilitate reductions in reactivity to daily stressful events in employees.

## STAR Workplace Intervention

This study drew upon a group-randomized field experiment conducted in the information technology (IT) industry. This workplace intervention, named STAR (Support-Transform-Achieve-Results) was designed to decrease work-family conflict by increasing employees' schedule control and supervisor support of employees' personal life. As intended, the STAR intervention resulted in increased supervisor support and schedule control (Kelly et al., 2014). Moreover, Almeida and colleagues (2016) found that supervisor support—a key component of STAR—buffered the association between daily work-to-family conflict and negative affect. Additionally, the intervention successfully reduced perceived stress, psychological distress, and emotional exhaustion (Kossek et al., 2019; Moen et al., 2016) and increased employees' sleep duration (Lee et al., 2016) and family functioning (Davis et al., 2015). STAR has been used in previous studies to examine impacts of the workplace intervention on well-being (Lee et al., 2017), cortisol levels (Almeida et al., 2018), and safety compliance (Hammer et al., 2016). However, no study has yet examined the impact of this intervention on employees' affective and physical responses to day-to-day stressors. It is unknown if experimental manipulation of supervisor support and schedule control can reduce affective and physical reactivity to daily stressors. Given that reactivity to daily stressors likely depends on resources of individuals and their environments, the COR theory would predict that increases in supervisor support and schedule control would also decrease reactivity to daily stressful events. Increases in interpersonal resources such as supervisor support for work and family concerns may be particularly helpful for decreasing reactivity to stressors that are interpersonal in nature.

## Current Study

The current study fills this gap by using a longitudinal daily diary design to examine the impact of the STAR workplace intervention on employed parents' affective and physical reactivity to daily stressors in various domains (i.e. work vs non-work and interpersonal vs non-interpersonal). We focused on employed parents with school-aged children as this group may experience more challenges to balance work and family demands than employees without children (Nomaguchi, 2009), and thus the STAR intervention could be particularly beneficial in mitigating their reactions to daily stressors. Daily diary designs are ideal for capturing within-person associations between stressors and well-being (i.e., stressor reactivity). Additionally, daily diary designs allow for the examination of within-person changes in affective and physical well-being in response to stressors, while adjusting for between-person differences in stressor exposure (Bolger & Zuckerman, 1995). By adjusting for individual differences in overall stressor exposure, we can determine the unique

intra-individual impact of the STAR workplace intervention on associations between daily stressors and well-being (i.e., stressor reactivity).

Framed by the COR theory and gain spiral model, we hypothesized that the STAR intervention would reduce employees' affective and physical reactivity to daily work and nonwork stressors. Specifically, compared to employees in the control condition, STAR employees would show less of an increase in negative affect and physical symptoms and less of a decrease in positive affect on days with stressors compared to days with no stressors. We hypothesized that this would hold for two domains of daily stressors: work stressors, (e.g., job demands or having an argument at work), and nonwork stressors, (e.g., stressful event at home or an argument outside of work). Furthermore, we hypothesized that the effects of the STAR intervention would be particularly salient for stressors both at work and outside of work that were interpersonal in nature (e.g., an argument with a coworker and spouse). We also expected that these associations would remain significant when adjusting for individuals' average stress levels as well as sociodemographic covariates.

## Method

### Participants

Participants were part of the Work, Family, and Health Study (WFHS), a study testing the effects of a workplace intervention on organizational, employee, and family well-being (see Bray et al., 2013). Fifty-six work teams in a Fortune 500 company were randomized to either the STAR or the control condition. A total of 823 employees completed a baseline interview prior to the implementation of the intervention. Of these employees, 209 participants were eligible to participate in a daily diary study because they had a child aged 9–17 living at home who also was willing to participate in a home interview and subsequent daily diary component. Of these eligible participants, 131 participated (62.7%) in the baseline daily diary, and 102 participants completed a follow-up daily diary assessment 12 months later (77.9%). The final sample of the study was comprised of 61 STAR and 41 control participants. There were no differences between employees who completed both baseline and follow-up assessments and those who did not ( $n = 29$ ) on age, gender, marital status, or intervention participation. On average, participants were 45.19 years old ( $SD = 5.84$ ). Participants were 54% men and 69% White. Nearly 80% had four or more years of college, and the average household income range was 110,000 – 119,999 dollars. The majority (87%) of participants were married or cohabitating, and participants had an average of two children living at home. Participants worked an average of 46.1 hours per week ( $SD = 5.77$ ). See Table 1 for demographic characteristics of the sample by intervention condition.

### Procedure

**Daily Diary**—Participants provided informed consent and completed in-person interviews at their workplace at baseline and again at the 12-month follow-up. The daily diary data collection took place one month following the workplace interviews. At the end of each day for eight consecutive days, participants completed a telephone interview about their daily experiences and well-being. Out of a possible 1632 daily interviews, participants

completed 1602 (98.4% completion). Participants received a total of \$250 for both baseline and 12-month follow-up.

**Workplace Intervention**—Prior to the baseline interviews, participants were randomly assigned to STAR or control condition (i.e., business as usual). The STAR intervention was designed to increase supervisor and coworker support for family and personal life and increasing employees' control over when and where they worked (Bray et al., 2013; Kelly et al., 2014). STAR consisted of a three-month structural and cultural change process, including training managers/supervisors to demonstrate support for employees' personal and family lives and facilitator-led sessions for employees to identify new work practices to help transition from rigid work schedule to giving employees more control over their work schedule. Participatory sessions for employees lasted eight hours, and managers attended an additional four hours of training (for details on STAR procedures, see Bray et al., 2013; Kelly et al., 2014; Kossek et al., 2014). All procedures were approved by appropriate Institutional Review Boards.

## Measures

**Daily Stressors**—Daily stressors were measured using an adapted version of the well-validated Daily Inventory of Stressful Events (DISE; Almeida, Wethington, & Kessler, 2002). Participants indicated if they had experienced any stressful event in the past 24 hours. Items distinguished between stressors that occurred within work and nonwork domains. For the work stressors, participants were asked if they experienced any of the following stressors at work in the last 24 hours (0 = *no*, 1 = *yes*): an argument, avoiding a potential argument, something happening to a coworker that was stressful to them, job demands, and any other stressor at work. Work stressors were summed for each day. Participants were asked if the following nonwork stressors occurred each day: an argument, avoiding a potential argument, a stressful event at home, something happening to a family member that was stressful to them, or any other stressors at home. Nonwork stressors were summed for each day. Additionally, to examine the impact of the intervention on interpersonal stressors specifically, we grouped the daily stressors into interpersonal stressors (i.e. having an argument and avoiding a potential argument) and non-interpersonal stressors (something happening to a coworker/family member, a stressful event at work/home, and any other stressor at work/home).

Participants reported experiencing zero work stressors 64% of days, one work stressor 26% of days, and two or more work stressors 10% of days across baseline and follow-up. Participants reported experiencing zero nonwork stressors 67% of days, one nonwork stressor 24% of days, and two or more nonwork stressors 9% of days. When examining interpersonal vs. non-interpersonal stressors, participants reported experiencing zero interpersonal stressors 75% of days, one interpersonal stressor 20% of days, and two or more interpersonal stressors 5% of all days. Participants reported experiencing zero non-interpersonal stressors 63% of all days, one non-interpersonal stressor 26% of all days, and two or more non-interpersonal stressors 11% of all days. The most common daily stressor experienced was a stressful demand at work (30% of all days) and a stressful demand at home (17% of all days). Given that participants reported experiencing a low number of

stressors (participants reported experiencing two or more stressors on only 11% of days), dichotomous variables were created to indicate the occurrence of any work stressor that day (0 = *no*, 1 = *yes*) and the occurrence of any nonwork stressor on a given day (0 = *no*, 1 = *yes*). Dichotomous variables were also created to indicate the occurrence of any interpersonal stressor (0 = *no*, 1 = *yes*) and the occurrence of any non-interpersonal stressor on a given day (0 = *no*, 1 = *yes*).

**Daily Positive and Negative Affect**—Each day, participants completed the Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988). On a scale from 1 (*none of the time*) to 5 (*all of the time*), participants rated the amount of time that day they experienced 10 types of negative affect (scared, afraid, upset, distressed, jittery, nervous, ashamed, guilty, irritable, and hostile) and 10 forms of positive affect (enthusiastic, interested, determined, excited, inspired, alert, active, strong, proud, and attentive). Responses on the negative affect items and positive affect items were averaged separately to create one score for negative affect (person-level alpha = .92; day-level alpha = .83) and for positive affect (person-level alpha = .96; day-level alpha = .92) for each day. Higher scores indicate more time experiencing negative or positive affect on a given day.

**Daily Physical Symptoms**—Participants were asked over the past day if they experienced any of 10 physical symptoms from the Larsen and Kasimatis (1991) physical symptom checklist. Symptoms included headache, back, neck, or shoulder pain, leg or foot pain, finger, hand, or wrist pain, eye strain, fatigue, cold/flu symptoms, allergies, stomach problems such as nausea or diarrhea, and any other physical symptom or discomfort. Participants indicated whether or not they experienced each symptom (0 = *no*, 1 = *yes*). Responses to the 10 items were summed to create the number of physical symptoms experienced each day. Symptom severity was not examined because participants reported experiencing 0 symptoms on almost half (48%) of all days.

**Measurement Burst**—A burst variable was created to examine change between baseline and follow-up assessments (0 = *baseline*, 1 = *12 month follow-up*).

**Within-Person (WP) Workplace Intervention Effects**—We created a WP STAR variable to compare changes from baseline to 12 months between the STAR and control condition. All participants were coded 0 at baseline. Participants in the STAR condition were coded 1 at follow-up, and participants who were assigned to the control condition were coded 0. This variable allows us to assess whether individuals in the STAR condition changed in their affective or physical reactivity to stressors compared to their baseline assessments relative to the control condition. This variable is useful because it condenses two variables (burst x condition) into one while estimating the same effect. *T*-tests showed that there was no differences between the STAR and control condition at baseline on negative affect,  $t(799) = -0.02, p = .39$ , positive affect,  $t(796) = 0.05, p = .39$ , or physical symptoms,  $t(799) = -0.11, p = .34$ .

**Covariates**—Demographic covariates included age, gender (0 = *men*, 1 = *women*), education level (0 = *no college degree*, 1 = *college degree*), and race (0 = *non-White*, 1 = *White*). Previous research has linked these factors with both stress and well-being

outcomes (Cohen & Janicki-Deverts, 2012). We included average number of stressors in the analyses (calculated by summing and averaging the total number of stressors mentioned across the diary period) to ensure that any differences in affect and symptom reactivity to daily stressors were not due to differences in stressor exposure. Employees in the STAR and control conditions did not differ in characteristics at baseline except schedule control and work hours. In order to adjust for these differences, we controlled for the extent of schedule control measured by the eight-item Control over Work Schedule Scale (Thomas & Ganster, 1995) and the number of hours worked in a typical week. The Control over Work Schedule Scale included items such as, “How much choice do you have over when you begin and end each work-day” and “How much choice do you have over when you take days off?” Items were averaged, with higher scores indicating greater control over work. Additionally, during the course of data collection, there was an announcement of an organizational merger. Some participants were informed about the merger before baseline while others were not. To account for any differences in stress reactivity that may have resulted from the merger, we included an indicator of timing of baseline data collection (0 = *pre-merger announcement*, 1 = *post-merger announcement*). All continuous variables were centered around the sample mean.

### Statistical Analyses

Using SAS 9.4, we ran multilevel models to account for the nesting of days within persons (Bryk & Raudenbush, 2002). Two-level models were run separately for the following outcomes: daily negative affect, daily positive affect, and number of daily physical symptoms. At Level 1, we entered a time-varying predictor to indicate the occurrence of any stressor that day (*yes/no*). Level 1 variables also included the burst variable and WP STAR variable. Time-invariant measures were entered at Level 2. The example equation for the model for negative affect is the following:

$$\text{Level 1: } NA_{ij} = \beta_{0j} + \beta_{1j}(\text{Burst}_{ij}) + \beta_{2j}(\text{STAR}_{ij}) + \beta_{3j}(\text{Stressor}_{ij}) + \beta_{4j}(\text{STAR}_{ij} * \text{Stressor}_{ij}) + r_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{averagestress}_j) + \gamma_{02}(\text{age}_j) + \gamma_{03}(\text{gender}_j) + \gamma_{04}(\text{race}_j) + \gamma_{05}(\text{education}_j) + \gamma_{06}(\text{merger}_j) + \gamma_{07}(\text{schedulecontrol}_j) + \gamma_{08}(\text{workhours}_j) + \mu_{0j}$$

$\beta_{1j}$  represents changes in negative affect from baseline to 12 months.  $\beta_{2j}$  represents the STAR effect, which is the differences between the STAR and control employees' changes in negative affect from baseline to 12 months.  $\beta_{3j}$  is the difference in negative affect on a stressor vs. nonstressor days (NA reactivity), and  $\beta_{4j}$  represents our primary effect of interest, the effect of STAR on changes in negative affect reactivity to daily stressors. Models were repeated for positive affect and symptoms as outcomes. Models were run separately for work, nonwork, interpersonal, and non-interpersonal stressors, for a total of 12 models.



## Results

### Descriptive Statistics

Means and between-person correlations of study variables are shown in Table 2. Employees who experienced more work stressors reported higher negative affect and greater physical symptoms. Employees who experienced more nonwork stressors reported higher negative affect, greater physical symptoms, and lower positive affect. Employees who experienced greater numbers of work stressors also reported greater numbers of nonwork stressors.

In order to see if the intervention was successful in increasing supervisor support and schedule control, we performed a manipulation check and compared average levels of supervisor support and schedule control reported by employees both before and after the intervention took place. Employees in STAR reported increases in schedule control ( $t(60) = 18.65, p < .001$ ) and supervisor support ( $t(60) = 2.86, p = .03$ ) from baseline to the 12-month follow-up. Employees in the UP condition did not report significant changes in schedule control ( $t(40) = 1.52, p = .12$ ), but did report an increase in supervisor support ( $t(40) = 3.43, p = .01$ ). These results show that the STAR intervention was successful at increasing both schedule control and supervisor support.

### Workplace Intervention and Stressor Reactivity

Before conducting multilevel models with predictors, we ran null models and calculated intra-class correlations to examine variance components in employees' negative affect, positive affect, and symptoms. For all three variables, a sizable portion of the variance was attributable to day-to-day fluctuations within persons (65% for negative affect, 34% for positive affect, and 59% for symptoms). This suggests that the use of multilevel models is appropriate, as a significant amount of variance in negative affect, positive affect, and symptoms is at the daily level.

**Work and Non-work Stressors**—Table 3 shows results of multilevel models examining the STAR workplace intervention effects on affective and physical reactivity to daily work stressors. The negative affect model shows the effect of the STAR on changes in negative affect reactivity from baseline to 12 months. First, experiencing a work stressor was significantly associated with negative affect ( $b = 0.07, p = 0.02, 95\% CI = 0.01, 0.15$ ), such that negative affect was greater on days when employees reported a work stressor compared to days they did not have a work stressor. There was no significant effect of burst ( $b = 0.00, p = 0.97, 95\% CI = -0.04, 0.05$ ), indicating that levels of negative affect were not significantly different between baseline and the 12-month assessment. Additionally, STAR did not significantly predict negative affect ( $b = -0.07, p = 0.05, 95\% CI = -0.15, 0.00$ ), indicating that employees in the STAR condition did not report significant decreases in negative affect from baseline to 12 months, compared to the control condition employees. However, in line with our main hypothesis, there was a significant STAR by daily work stressor interaction ( $b = -0.09, p = 0.01, 95\% CI = -0.16, -0.01$ ): Following the intervention, employees in the STAR condition had smaller increases in negative affect on days when a work stressor occurred compared to days without a work stressor. The magnitude of the difference between STAR and UP employees in the reactivity slope

(0.09) was comparable to the 60% of the effect of average stressors (0.09/0.15), which is a well-known risk factor for negative affect. This finding supports our hypothesis that the workplace intervention reduced negative affect reactivity to work stressors. See Figure 1 for an illustration.

For both positive affect ( $b = -0.07$ ,  $p = 0.27$ ,  $95\% CI = -0.20, 0.06$ ) and physical symptoms ( $b = -0.09$ ,  $p = 0.53$ ,  $95\% CI = -0.40, 0.21$ ), there was no significant STAR by daily work stressor interaction. Positive affect and physical symptoms on work stressor versus nonstressor days were not significantly different between STAR and control condition employees. This indicates that contrary to our hypothesis, the workplace intervention did not reduce positive affect reactivity or physical reactivity to work stressors.

Table 4 shows the effects of the STAR workplace intervention on affective and physical reactivity to daily nonwork stressors. Similar to the model for work stressors, experiencing a nonwork stressor was significantly associated with negative affect ( $b = 0.10$ ,  $p < .001$ ,  $95\% CI = 0.04, 0.15$ ), such that negative affect was greater on days when employees reported a nonwork stressor compared to days they did not have a nonwork stressor. However, there was no significant association of a nonwork stressor with positive affect ( $b = -0.04$ ,  $p = 0.34$ ,  $95\% CI = -0.15, 0.05$ ) or with physical symptoms ( $b = 0.19$ ,  $p = 0.09$ ,  $95\% CI = -0.03, 0.40$ ). Contrary to our main hypothesis, there was no significant STAR by daily nonwork stressor interaction predicting negative affect ( $b = -0.03$ ,  $p = 0.33$ ,  $95\% CI = -0.09, 0.03$ ), positive affect ( $b = -0.02$ ,  $p = 0.69$ ,  $95\% CI = -0.14, 0.09$ ), or physical symptoms ( $b = -0.18$ ,  $p = 0.17$ ,  $95\% CI = -0.44, 0.08$ ). That is, the STAR workplace intervention did not significantly change negative affect, positive affect, or physical symptom reactivity to nonwork stressors.

**Interpersonal and Non-Interpersonal Stressors**—Table 5 shows the effects of the STAR workplace intervention on affective and symptom reactivity to daily interpersonal stressors across work and nonwork domains. Experiencing an interpersonal stressor was significantly associated with negative affect ( $b = 0.14$ ,  $p < .001$ ,  $95\% CI = 0.08, 0.20$ ) and physical symptoms ( $b = 0.19$ ,  $p < .001$ ,  $95\% CI = 0.05, 0.44$ ), such that negative affect and physical symptoms were greater on days when employees reported an interpersonal stressor compared to days they did not have an interpersonal stressor. There was no significant association of an interpersonal stressor with positive affect ( $b = -0.04$ ,  $p = 0.36$ ,  $95\% CI = -0.16, 0.06$ ). Additionally, there was no significant STAR by daily interpersonal stressor interaction predicting negative affect ( $b = -0.02$ ,  $p = 0.36$ ,  $95\% CI = -0.05, 0.09$ ), positive affect ( $b = -0.02$ ,  $p = 0.64$ ,  $95\% CI = -0.15, 0.11$ ), or physical symptoms ( $b = -0.28$ ,  $p = 0.06$ ,  $95\% CI = -0.57, 0.01$ ), indicating that the intervention did not change reactivity to interpersonal stressors.

Table 6 shows the effects of the STAR workplace intervention on affective and symptom reactivity to daily non-interpersonal stressors across work and nonwork domains. Experiencing a non-interpersonal stressor was significantly associated with negative affect ( $b = 0.09$ ,  $p < .001$ ,  $95\% CI = 0.04, 0.14$ ) and positive affect ( $b = -0.09$ ,  $p = .03$ ,  $95\% CI = -0.19, -0.01$ ), such that negative affect was greater and positive affect was lower on days when employees reported a non-interpersonal stressor compared to days they did not have

a non-interpersonal stressor. There was no significant association of a non-interpersonal stressor with physical symptoms ( $b = 0.13, p = 0.24, 95\% CI = -0.09, 0.35$ ). However, there was a significant STAR by daily non-interpersonal stressor interaction predicting negative affect ( $b = -0.08, p = 0.02, 95\% CI = -0.14, -0.02$ ), and physical symptoms ( $b = -0.26, p = 0.04, 95\% CI = -0.52, -0.01$ ), indicating that the workplace intervention reduced negative affect and physical symptom reactivity to non-interpersonal stressors.

## Discussion

The goal of this study was to investigate the impact of a workplace intervention designed to increase employee resources through supervisor support and schedule control on affective and physical reactivity to daily stressors. Guided by the conservation of resources theory and gain spirals model (Hobfoll, 2001), we hypothesized that employees in the intervention condition would experience reductions in affective and physical reactivity to both work and nonwork stressors, and that these reductions in reactivity would be particularly salient for interpersonal stressors. Results showed that the STAR workplace intervention was effective in decreasing employees' negative affect reactivity to work stressors, but not to nonwork stressors, at the 12-month post-intervention follow-up. This finding demonstrates within-person decreases in stressor reactivity among employees who received the intervention, but not among employees in the control condition. There were no differences between the intervention and control condition in positive affect or physical symptom reactivity to work or nonwork stressors. Furthermore, contrary to our hypotheses, the STAR intervention was effective in decreasing employees' physical and negative affective reactivity to non-interpersonal stressors, but not to interpersonal stressors. Using an experimental paradigm, this study adds to the work-related stress and demand-resources literature by showing that a positive workplace intervention in the form of increased supervisor support and schedule control promotes employees' ability to regulate negative emotions when experiencing non-interpersonal stressors at work.

These findings build on past correlational research that demonstrates an association between increasing interpersonal and structural workplace resources and daily stressors and well-being (Almeida et al., 2016; Grzywacz et al., 2002). By using daily diary data collected before and after a group-randomized field experiment, we were able to establish a causal link between the manipulation targeting supervisor support and schedule control, and employees' reactivity to daily stressors. The STAR workplace intervention was effective in decreasing employees' negative affect reactivity to daily work stressors. Thus, an experimental manipulation increasing schedule control and supervisor support provided employees more resources to cope with daily stressors at work and reduced their negative reactions to daily work stressors. The COR theory and gain spirals model posits a reciprocal relationship between resources and well-being, such that workers can use available resources to further enhance general resources and well-being (Hakanen et al., 2011). Our study suggests that by increasing resources at work in the form of increased interpersonal support from supervisors and increased schedule control, employed parents' personal resources increased and helped them regulate negative emotions when faced with daily stressful events at work.

However, counter to our hypotheses, we did not see the same impact of the intervention on negative affect reactivity to nonwork stressors. We expected that resources accumulated through the workplace intervention would also alleviate stressors outside of work. Studies have found that chronic work demands increase the number and severity of daily home stressors (e.g., Serido et al., 2004). And, although there is evidence that the STAR intervention had significant effects on family life (e.g., Davis et al., 2015; McHale et al., 2016), results of this study show that an increase in work resources did not impact reactions to nonwork stressors. Some studies have found that positive spillover between work and family is not associated with prevalence of family stressors (Grzywacz et al, 2002). The results of our study support this by showing that the workplace intervention did not benefit emotional regulation to nonwork stressors. It is possible that resources obtained from the workplace intervention were insufficient to deal with nonwork stressors. It is also possible that the psychological impact of nonwork stressors may be more salient than that of work stressors. Future research should examine how these associations may differ by severity, specific type, and social context of stressors in each domain.

Additionally, there were no differences in positive affect reactivity or physical symptom reactivity to daily work and nonwork stressors in the STAR employees compared to the control condition. One explanation for this may be that negative emotional reactions to daily stressors are more amenable to change than positive affect or symptom reactivity. An intervention study aimed at using cognitive behavior therapy to reduce reactivity to daily stressors showed reductions in negative affect reactivity to daily stressors, but not positive affect reactivity (McIntyre et al., 2019). Another potential explanation could have to do with specific aspects of this intervention. Having a more supportive supervisor and more control over their work schedule may help people manage their negative emotions when stressors arise at work, but may not necessarily help improve positive emotions or physical symptoms in response to daily stressors. Additionally, positive affect and physical symptoms have a greater proportion of between-person level (and less within-person) variance compared to negative affect (Lee et al., 2017). This may have contributed to small degrees of changes in positive affect and physical symptoms between stressor vs. nonstressor days, which likely contributed to the null effect of the intervention on positive affect and physical reactivity to stressors.

Finally, contrary to our hypotheses, the workplace intervention reduced negative affect and physical symptom reactivity to non-interpersonal stressors, but not interpersonal stressors. Although initially surprising, one explanation could be that although parts of the intervention were to increase resources that were interpersonal in nature (i.e., supervisor support for family and personal life), the increase in interpersonal resources did not help mitigate the impact of interpersonal stressors, but instead helped employees manage competing non-interpersonal job and home demands. Indeed, employees reported greater numbers of non-interpersonal than interpersonal stressors, with the most common daily stressor experienced being a (non-interpersonal) stressful demand at work and a (non-interpersonal) stressful demand at home.

## Practical Implications

These findings are important because they demonstrate that workplace interventions can promote employees' ability to regulate negative emotions when faced with daily work-related stressors. Increasing interpersonal resources such as supervisor support and schedule control can help employees react less negatively to daily work-related stressors. Negative reactions to stressors at work can have negative consequences on organizations (e.g., interpersonal conflicts, loss of work productivity, absenteeism, presenteeism, and turnover). As such, employers and practitioners may need to put more efforts to make positive changes in work environments to promote employee health and well-being.

Additionally, results from this study illustrate the need to help working parents manage their day-to-day life. One way to do that is through implementing structural changes in the workplace by increasing organizational support in the form of supervisor support and work schedule control. Other workplace initiatives have demonstrated the utility of improving workplace practices to enhance well-being. For example, Kossek and Hammer (2008) trained grocery store managers to be more supportive and sensitive to employees' work-life challenges. As a result, employees had better sleep quality, were more satisfied with their jobs, and had better overall health. Another initiative increased schedule control in a retail store (Lambert 2009). More predictable and flexible work schedules were related to lower stress and increased well-being. Combined with these initiatives, the current study demonstrates that organizational support in the IT workplace can decrease negative affective reactivity to work stressors among the employed parents who may encounter frequent stressors by juggling work and family roles.

## Limitations and Future Directions

This study is qualified by a few limitations. First, the STAR workplace intervention was implemented in person in the IT industry. These findings may not extend to other types of industries that may have different work demands and characteristics. Relatedly, our sample was relatively privileged in income and education compared to other US workers. Our results may not be generalizable to other employees with varying levels of education and income. Future studies should examine these links in more diverse samples of employed parents across different industries. Additionally, future studies should consider diverse intervention strategies to improve employee well-being, as work stress is likely to increase in years to come due to shifts to remote work and changing work norms in our society. A second limitation has to do with the timing of stressful event and daily well-being variables. Participants were asked about emotions, physical symptoms, and stressors over the past 24 hours, and short-term retrospective reports were used to calculate affective and physical reactivity to stressors. As a result, we cannot tease apart any temporal sequence for stressors, affect, and physical symptoms or whether a third factor was driving these occurrences. Thus, our interpretation was limited to the association of these variables on the daily level. Additionally, it is possible that report biases may have led to spurious relationships between people's reports of stressors, affect, and symptoms within the same day. Future momentary sampling studies may expand these findings to explore the sequential nature of these experiences. In contrast, the STAR effects on daily stress reactivity and the links between daily stressors and well-being at the 12-month follow-up do allow for

causal inference. Organizational-level change caused increased ability to regulate negative emotions when experiencing daily stressful events at work. Third, even though employees were randomly assigned to either STAR or the UP condition, participants in the STAR condition had significantly higher schedule control than participants in the UP condition at baseline. Although we adjusted for baseline schedule control in analyses, future intervention studies should replicate these results in designs where schedule control is similar between conditions at baseline. Finally, it will be important for future research to unpack the nature of nonwork stressors. In this study, nonwork stressors were not limited to family stressors, but encompassed any stressful event that happened outside of work. With much of the research focusing specifically on family-related stressors, it may be useful for future research to examine the impacts of workplace interventions on reactivity to family-specific stressors.

## Conclusion

This study investigated the effect of a workplace intervention on employees' affective and physical reactivity to daily stressors in various domains. Results showed that the intervention significantly reduced employees' negative affect reactivity to work stressors, as well as negative affect and physical symptom reactivity to non-interpersonal stressors. The intervention did not decrease employees' positive affect or symptom reactivity to work stressors and did not reduce any type of reactivity to non-work stressors or interpersonal stressors. Findings indicate that a workplace experiment targeting increases in supervisor support and schedule control can promote employees' ability to regulate negative emotions when faced with daily work-related stressors and stressors that are non-interpersonal in nature. It is important that researchers continue to investigate the impact of positive interpersonal and structural organizational changes in an effort to promote employee health and well-being.

## References

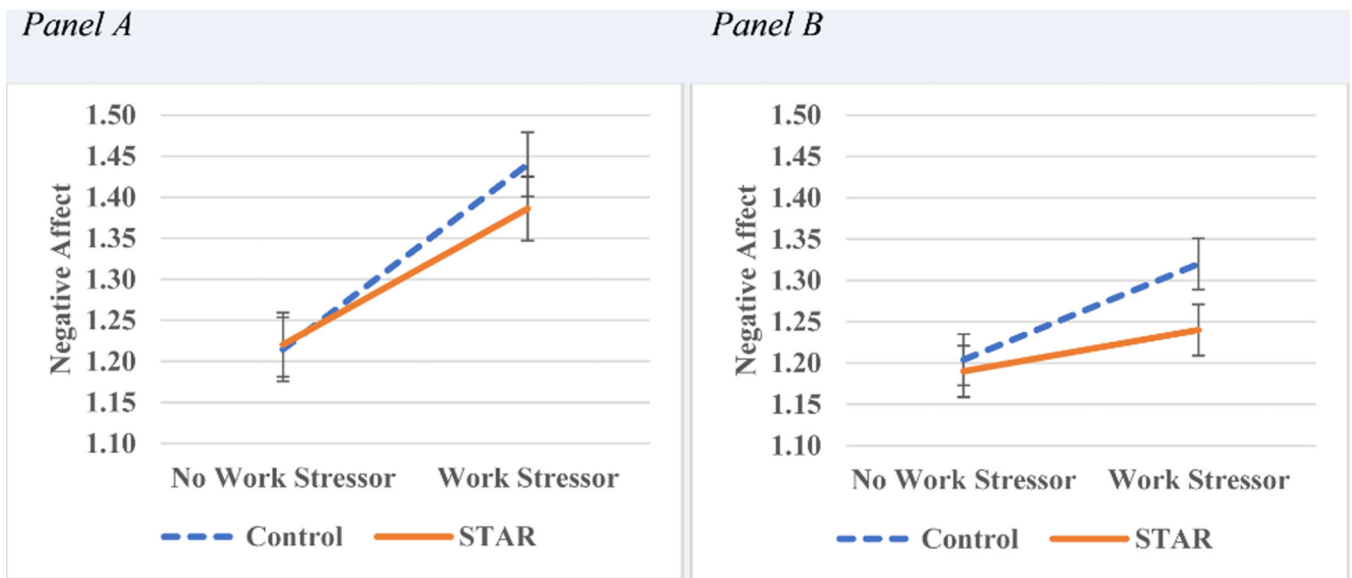
- Almeida DM (2005). Resilience and vulnerability to daily stressors assessed via diary methods. *Current Directions in Psychological Science*, 14, 64–68.
- Almeida DM, & Davis KD (2011). Workplace flexibility and daily stress processes in hotel employees and their children. *The Annals of the American Academy of Political and Social Science*, 638, 123–140. 10.1177/0002716211415608 [PubMed: 23833321]
- Almeida DM, Davis KD, Lee S, Lawson KM, Walter KN, & Moen P. (2016). Supervisor support buffers daily psychological and physiological reactivity to work-to-family conflict. *Journal of Marriage and Family*, 78, 165–179. 10.1111/jomf.12252 [PubMed: 26778857]
- Almeida DM, Lee S, Walter KN, Lawson KM, Kelly EL, & Buxton OM (2018). The effects of a workplace intervention on employees' cortisol awakening response. *Community, Work & Family*, 21, 151–167. 10.1080/13668803.2018.1428172
- Almeida DM, Wethington E, & Kessler RC (2002). The daily inventory of stressful events: An interview-based approach for measuring daily stressors. *Assessment*, 9, 41–55. 10.1177/1073191102091006 [PubMed: 11911234]
- Appelberg K, Romanov K, Heikkilä K, Honkasalo ML, & Koskenvuo M. (1996). Interpersonal conflict as a predictor of work disability: a follow-up study of 15,348 Finnish employees. *Journal of Psychosomatic Research*, 40, 157–167. 10.1016/0022-3999(95)00576-5 [PubMed: 8778398]
- Birditt KS, Fingerman KL, & Almeida DM (2005). Age differences in exposure and reactions to interpersonal tensions: a daily diary study. *Psychology and Aging*, 20, 330–340. 10.1037/0882-7974.20.2.330 [PubMed: 16029096]

- Bolger N, & Schilling EA (1991). Personality and problems of everyday life: The role of neuroticism in exposure and reactivity to daily stressors. *Journal of Personality*, 59, 356–386. 10.1111/j.1467-6494.1991.tb00253.x
- Bolger N, & Zuckerman A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology*, 69, 890–902. 10.1037/0022-3514.69.5.890 [PubMed: 7473036]
- Bray JW, Kelly EL, Hammer LB, Almeida DM, Dearing JW, King RB, & Buxton OM (2013). An integrative, multilevel, and transdisciplinary research approach to challenges of work, family, and health. *Methods Report*, 1–38. RTI Press.
- Bryk AS, & Raudenbush SW (1992). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications, Inc.
- Casey PR, & Grzywacz JG (2008). Employee health and well-being: The role of flexibility and work-family balance. *The Psychologist-Manager Journal*, 11, 31–47. 10.1080/10887150801963885
- Charles ST, & Almeida DM (2006). Daily reports of symptoms and negative affect: Not all symptoms are the same. *Psychology and Health*, 21, 1–17. 10.1080/14768320500129239
- Charles ST, Piazza JR, Mogle J, Sliwinski MJ & Almeida DM (2013). The wear and tear of daily stressors on mental health. *Psychological Science*, 24, 1–9. 10.1177/0956797612462222
- Chiang JJ, Turiano NA, Mroczek DK, & Miller GE (2018). Affective reactivity to daily stress and 20-year mortality risk in adults with chronic illness: Findings from the National Study of Daily Experiences. *Health Psychology*, 37, 170–178. 10.1037/hea0000567 [PubMed: 29154603]
- Cohen S, & Janicki-Deverts DENISE (2012). Who's stressed? Distributions of psychological stress in the United States in probability samples from 1983, 2006, and 2009 1. *Journal of Applied Social Psychology*, 42(6), 1320–1334.
- Cohen S, & Wills TA (1985). Stress, social support, and the buffering hypothesis. *Psychological bulletin*, 98(2), 310–357. 10.1037/0033-2909.98.2.310 [PubMed: 3901065]
- Davis KD, Gere J, & Sliwinski MJ (2017). Investigating the work–family conflict and health link: Repetitive thought as a mechanism. *Stress and Health*, 33, 330–338. 10.1002/smi.2711 [PubMed: 27709792]
- Davis KD, Lawson KM, Almeida DM, Kelly EL, King RB, Hammer L, ... & McHale SM (2015). Parents' daily time with their children: A workplace intervention. *Pediatrics*, 135, 875–882. 10.1542/peds.2014-2057 [PubMed: 25869371]
- De Raeve L, Jansen NWH, van den Brandt PA, Vasse R, & Kant IJ (2009). Interpersonal conflicts at work as a predictor of self-reported health outcomes and occupational mobility. *Occupational & Environmental Medicine*, 66, 16–22. [PubMed: 19095708]
- Epel ES, Crosswell AD, Mayer SE, Prather AA, Slavich GM, Puterman E, & Mendes WB (2018). More than a feeling: A unified view of stress measurement for population science. *Frontiers in Neuroendocrinology*, 49, 146–169. 10.1016/j.yfrne.2018.03.001 [PubMed: 29551356]
- Frone MR (2000). Interpersonal conflict at work and psychological outcomes: testing a model among young workers. *Journal of Occupational Health Psychology*, 5(2), 246–255. 10.1037/1076-8998.5.2.246 [PubMed: 10784288]
- Glass JL, & Finley A. (2002). Coverage and effectiveness of family-responsive workplace policies. *Human Resource Management Review*, 12, 313–337. 10.1016/S1053-4822(02)00063-3
- Grzywacz JG, Almeida DM, & McDonald DA (2002). Work–family spillover and daily reports of work and family stress in the adult labor force. *Family Relations*, 51, 28–36. 10.1111/j.1741-3729.2002.00028.x
- Hakanen JJ, Peeters MC, & Perhoniemi R. (2011). Enrichment processes and gain spirals at work and at home: A 3-year cross-lagged panel study. *Journal of Occupational and Organizational Psychology*, 84(1), 8–30. 10.1111/j.2044-8325.2010.02014.x
- Hakanen JJ, Perhoniemi R, & Toppinen-Tanner S. (2008). Positive gain spirals at work: From job resources to work engagement, personal initiative and work-unit innovativeness. *Journal of Vocational Behavior*, 73(1), 78–91. 10.1016/j.jvb.2008.01.003
- Hammer LB, Johnson RC, Crain TL, Bodner T, Kossek EE, Davis KD, Kelly EL, Buxton OM, Karuntzos G, Chosewood LC, & Berkman L. (2016). Intervention effects on safety compliance

- and citizenship behaviors: Evidence from the Work, Family, and Health Study. *Journal of Applied Psychology*, 10(2), 190–208. 10.1037/apl0000047
- Hammer LB, Kossek EE, Anger WK, Bodner T, & Zimmerman KL (2011). Clarifying work–family intervention processes: The roles of work–family conflict and family-supportive supervisor behaviors. *Journal of Applied Psychology*, 96, 134–150.
- Hammer LB, Kossek EE, Yragui NL, Bodner TE, & Hanson GC (2009). Development and validation of a multidimensional measure of family supportive supervisor behaviors (FSSB). *Journal of Management*, 35, 837–856. 10.1177/0149206308328510 [PubMed: 21660254]
- Harvey S, Blouin C, & Stout D. (2006). Proactive personality as a moderator of outcomes for young workers experiencing conflict at work. *Personality and Individual Differences*, 40(5), 1063–1074. 10.1016/j.paid.2005.09.021
- Hobfoll SE (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, 50(3), 337–421. 10.1111/1464-0597.00062
- Hobfoll SE (2012). *Conservation of resources theory: Its implication for stress, health, and resilience*. Oxford University Press. 10.1093/oxfordhb/9780195375343.013.0007
- Kossek EE, & Hammer LB (2008). Supervisor work/life training gets results. *Harvard Business Review*, 86, 36–36.
- Kossek EE, Hammer LB, Kelly EL, & Moen P. (2014). Designing work, family & health organizational change initiatives. *Organizational Dynamics*, 43, 53–63. 10.1016/j.orgdyn.2013.10.007 [PubMed: 24683279]
- Kossek EE, Thompson RJ, Lawson KM, Bodner T, Perrigino MB, Hammer LB, ... & Wipfli B. (2019). Caring for the elderly at work and home: Can a randomized organizational intervention improve psychological health?. *Journal of Occupational Health Psychology*, 24, 36. 10.1037/ocp0000104 [PubMed: 29215909]
- Kelly EL, Moen P, Oakes JM, Fan W, Okechukwu C, Davis KD, ... & Mierzwa F. (2014). Changing work and work-family conflict: Evidence from the work, family, and health network. *American sociological review*, 79, 485–516. 10.1177/0003122414531435 [PubMed: 25349460]
- Lambert SJ (2009). Making a difference for hourly employees. *Work-life Policies*, 169–195.
- Larsen RJ, & Kasimatis M. (1991). Day-to-day physical symptoms: Individual differences in the occurrence, duration, and emotional concomitants of minor daily illnesses. *Journal of personality*, 59, 387–423. 10.1111/j.1467-6494.1991.tb00254.x [PubMed: 1960638]
- Lazarus RS, & Folkman S. (1984). *Stress, appraisal, and coping*. Springer publishing company.
- Lee S, Davis KD, Neuendorf C, Grandey A, Lam CB, & Almeida DM (2016). Individual- and organization-level work-to-family spillover are uniquely associated with hotel managers' work exhaustion and satisfaction. *Frontiers in psychology*, 7, 1180. 10.3389/fpsyg.2016.01180 [PubMed: 27582712]
- Lee S, McHale SM, Crouter AC, Kelly EL, Buxton OM, & Almeida DM (2017). Perceived time adequacy improves daily well-being: day-to-day linkages and the effects of a workplace intervention. *Community, Work & Family*, 20, 500–522. 10.1080/13668803.2017.1365691
- McHale SM, Davis KD, Green K, Casper L, Kan ML, Kelly EL, King RB, & Okechukwu C. (2016). Effects of a workplace intervention on parent-child relationships. *Journal of Child and Family Studies*, 25, 553–561. 10.1007/s10826-015-0254-z [PubMed: 26957897]
- McIntyre KM, Mogle JA, Scodes JM, Pavlicova M, Shapiro PA, Gorenstein EE, ... & Sloan RP (2019). Anger-reduction treatment reduces negative affect reactivity to daily stressors. *Journal of Consulting and Clinical Psychology*, 87, 141–150. 10.1037/ccp0000359 [PubMed: 30507214]
- Moen P, Kelly EL, Fan W, Lee SR, Almeida D, Kossek EE, & Buxton OM (2016). Does a flexibility/support organizational initiative improve high-tech employees' well-being? Evidence from the Work, Family, and Health Network. *American Sociological Review*, 81, 134–164. 10.1177/0003122415622391
- Mroczek DK, Stawski RS, Turiano NA, Chan W, Almeida DM, Neupert SD, & Spiro A III. (2015). Emotional reactivity and mortality: Longitudinal findings from the VA normative aging study. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 70, 398–406. 10.1093/geronb/gbt107



- Nakata A, Haratani T, Takahashi M, Kawakami N, Arito H, Kobayashi F, & Araki S. (2004). Job stress, social support, and prevalence of insomnia in a population of Japanese daytime workers. *Social Science & Medicine*, 59(8), 1719–1730. 10.1016/j.socscimed.2004.02.002 [PubMed: 15279928]
- Neupert SD, Almeida DM, & Charles ST (2007). Age differences in reactivity to daily stressors: The role of personal control. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 62, 216–225. 10.1093/geronb/62.4.P216
- Nomaguchi KM (2009). Change in work-family conflict among employed parents between 1977 and 1997. *Journal of Marriage and Family*, 71(1), 15–32. 10.1111/j.1741-3737.2008.00577.x
- Pew Research Center. (2015). Raising kids and running a household: How working parents share the load. <https://www.pewsocialtrends.org/2015/11/04/raising-kids-and-running-a-household-how-working-parents-share-the-load/>
- Piazza JR, Charles ST, Slwinski M, Mogle J, & Almeida DM (2013). Affective reactivity to daily stressors and long-term risk of reporting a chronic health condition. *Annals of Behavioral Medicine*, 45(1), 110–120. 10.1007/s12160-012-9423-0 [PubMed: 23080393]
- Piazza JR, Stawski RS, & Sheffler JL (2019). Age, daily stress processes, and allostatic load: A longitudinal study. *Journal of Aging and Health*, 31, 1671–1691. 10.1177/0898264318788493 [PubMed: 30019595]
- Schaufeli WB, & Taris TW (2014). A critical review of the job demands-resources model: Implications for improving work and health. *Bridging Occupational, Organizational and Public Health*, 43–68. 10.1007/978-94-007-5640-3\_4
- Schieman S, Glavin P, & Milkie MA (2009). When work interferes with life: Work-nonwork interference and the influence of work-related demands and resources. *American Sociological Review*, 74, 966–988. 10.1177/000312240907400606
- Serido J, Almeida DM, & Wethington E. (2004). Chronic stressors and daily hassles: Unique and interactive relationships with psychological distress. *Journal of Health and Social Behavior*, 45, 17–33. 10.1177/002214650404500102 [PubMed: 15179905]
- Sin NL, Graham-Engeland JE, Ong AD, & Almeida DM (2016). Affective reactivity to daily stressors is associated with elevated inflammation. *Health Psychology*, 34, 1154–1165. 10.1037/hea0000240
- Sulsky L, & Smith CS (2007). Work stress: Macro-level work stressors. In Monat A, Lazarus RS, & Reevy G. (Eds.) *The Praeger handbook on stress and coping* (pp. 53–86). Westport, CT: Praeger Publishers.
- Ten Brummelhuis LL, & Bakker AB (2012). A resource perspective on the work-home interface: The work-home resources model. *American Psychologist*, 67, 545–556. 10.1037/a0027974
- Thomas LT, & Ganster DC (1995). Impact of family-supportive work variables on work-family conflict and strain: A control perspective. *Journal of Applied Psychology*, 80, 6–15. 10.1037/0021-9010.80.1.6
- Watson D, Clark LA, & Tellegen A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. 10.1037/0022-3514.54.6.1063 [PubMed: 3397865]
- Wright RR, Mohr CD, Sinclair RR, & Yang LQ (2015). Sometimes less is more: Directed coping with interpersonal stressors at work. *Journal of Organizational Behavior*, 36(6), 786–805. 10.1002/job.2002



**Figure 1.**  
Effect of a Workplace Intervention (STAR) on Employee Negative Affect Reactivity to Work Stressors at Baseline (Panel A) and at Follow-up (panel B)

**Table 1**

## Baseline Descriptive Statistics by STAR Workplace Intervention Condition

	STAR ( <i>n</i> = 61)		Control ( <i>n</i> = 41)	
	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>
Gender				
Women	52.28		63.59	
Men	47.72		36.41	
Age	44.64	5.66	45.55	5.93
Race				
White	70.50		68.91	
Non-White	29.50		31.09	
Education				
College graduate	78.57		80.47	
Non-college graduate	21.43		19.53	
Marital status				
Married	80.23		83.28	
Cohabiting	6.63		5.94	
Single	13.15		10.78	
Number of children	2.29	1.42	1.95	0.88
Household income range <sup>a</sup>	8.10	3.04	8.94	2.88
Work hours	45.30	5.32	46.63	6.00

<sup>a</sup>Household income ranges from 1 = *less than 49,999* to 12 = *more than 150,000*.

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Table 2

Means and Between-Person Correlations Among Main Variables of Interest

	<i>M</i> %	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Negative affect	1.23	0.20	--												
2. Positive affect	2.90	0.65	-0.11	-											
3. Physical symptoms	1.08	0.95	<b>0.48</b>	-0.18	-										
4. Work stressors <sup>a</sup>	36%		<b>0.53</b>	0.06	<b>0.44</b>	-									
5. Non-work stressors <sup>b</sup>	33%		<b>0.56</b>	-0.14	<b>0.56</b>	<b>0.52</b>	-								
6. Intervention <sup>c</sup>	60%		0.03	-0.06	0.04	<b>0.22</b>	0.10	--							
7. Gender <sup>d</sup>	46%		0.11	-0.15	0.21	0.07	0.15	0.15	-						
8. Age	45.18	5.83	0.02	<b>0.25</b>	-0.03	0.17	0.17	0.08	-0.07	-					
9. Race <sup>e</sup>	70%		0.09	0.05	0.07	<b>0.25</b>	0.18	0.02	-0.15	0.03	-				
10. Education	79%		0.18	-0.09	0.04	0.09	0.14	-0.02	-0.11	0.04	0.14	-			
11. Schedule control	3.58	0.74	-0.15	0.15	-0.10	<b>-0.31</b>	-0.02	<b>-0.20</b>	-0.09	0.09	-0.02	-0.11	-		
12. Merger	47%		0.08	-0.01	0.10	0.02	0.06	-0.03	0.15	0.06	-0.01	-0.10	0.04	-	
13. Work hours	46.11	5.77	0.06	0.23	0.16	<b>0.46</b>	0.04	0.11	-0.03	0.00	0.02	-0.01	-0.23	-0.17	-
14. Average stressors	0.81	0.63	<b>0.64</b>	-0.06	<b>0.62</b>	<b>0.78</b>	<b>0.87</b>	0.13	0.13	0.20	0.24	0.14	-0.18	0.03	<b>0.25</b>

<sup>a</sup>Work stressors: 0 = no, 1 = yes.<sup>b</sup>Nonwork stressors: 0 = no, 1 = yes.<sup>c</sup>Intervention Condition: 0 = Control, 1 = STAR.<sup>d</sup>Gender: 0 = women, 1 = men.<sup>e</sup>Race: 0 = non-white, 1 = white.Note. Significant values are bolded at the  $p < .01$  level.

**Table 3**

Effects of the STAR Workplace Intervention on Affective and Physical Reactivity to Daily Stressors at Work

	Negative Affect (N = 1,210 days)		Positive Affect (N = 1,208 days)		Physical Symptoms (N = 1,210 days)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Fixed effects						
Intercept	1.29	1.20, 1.37	2.82	2.56, 3.08	1.35	0.96, 1.74
Burst	0.00	-0.04, 0.05	0.15***	0.06, 0.24	-0.05	-0.25, 0.15
Gender <sup>a</sup>	0.01	-0.06, 0.07	-0.17	-0.43, 0.08	0.31	-0.03, 0.65
Age	0.00	-0.01, 0.01	0.02*	0.00, 0.05	-0.02	-0.05, 0.01
Race <sup>b</sup>	-0.03	-0.11, 0.04	0.05	-0.22, 0.32	-0.06	-0.42, 0.31
Education <sup>c</sup>	0.04	-0.04, 0.12	-0.11	-0.42, 0.20	-0.01	-0.43, 0.40
Schedule control	-0.01	-0.06, 0.03	0.15	-0.02, 0.33	0.04	-0.19, 0.27
Merger	0.03	-0.03, 0.09	0.04	-0.21, 0.20	0.14	-0.19, 0.48
Work hours	0.00	-0.01, 0.00	0.03*	0.01, 0.05	0.01	-0.02, 0.03
Average stressors	0.15***	0.09, 0.21	0.03	-0.06, 0.12	0.77***	0.58, 0.95
WP STAR	-0.07	-0.15, 0.00	-0.09	-0.04, 0.22	-0.21	-0.09, 0.53
Work stressor	0.07*	0.01, 0.13	-0.04	-0.15, 0.07	0.17*	0.15, 0.42
WP STAR × Work stressor	-0.09*	-0.16, -0.01	-0.07	-0.20, 0.06	-0.09	-0.40, 0.21
Random effects						
Variance intercept	0.02***	0.01, 0.03	0.37***	0.28, 0.52	0.60***	0.44, 0.87
Variance residual	0.06***	0.06, 0.07	0.18***	0.17, 0.20	1.12***	1.03, 1.22

<sup>a</sup>Reference = *women*.<sup>b</sup>Reference = *non-white*.<sup>c</sup>Reference = *college graduate*.\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$

**Table 4**

Effects of the STAR Workplace Intervention on Affective and Physical Reactivity to Non-work Daily Stressors

	Negative Affect (N = 1,606 days)		Positive Affect (N = 1,602 days)		Physical Symptoms (N = 1,606 days)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Fixed effects Intercept	1.31	1.23, 1.38	2.29 <sup>***</sup>	1.65, 2.92	1.27	0.45, 2.08
Burst	0.00	-0.04, 0.03	0.13 <sup>***</sup>	0.05, 0.21	-0.1	-0.27, 0.07
Gender	0.01	-0.06, 0.07	-0.15	-0.40, 0.10	0.26	-0.03, 0.65
Age	0.00	-0.01, 0.01	0.03 <sup>*</sup>	0.00, 0.05	-0.02	-0.05, 0.01
Race	-0.02	-0.09, 0.05	0.05	-0.22, 0.31	-0.04	-0.42, 0.31
Education	0.05	-0.02, 0.13	-0.15	-0.45, 0.15	-0.01	-0.43, 0.40
Schedule control	-0.02	-0.06, 0.02	0.15	-0.02, 0.32	0.02	-0.19, 0.27
Merger	0.03	-0.03, 0.09	0.02	-0.22, 0.27	0.14	-0.19, 0.48
Hours worked	0.00	-0.01, 0.00	0.03	0.01, 0.05	0.01	-0.02, 0.03
Average stressors	0.14 <sup>***</sup>	0.11, 0.18	0.03	-0.05, 0.10	0.63	0.47, 0.79
WP STAR	-0.05	-0.02, 0.10	-0.02	-0.15, 0.10	-0.17	-0.44, 0.11
Non-work stressor	0.10 <sup>***</sup>	0.04, 0.15	-0.04	-0.15, 0.05	0.19	-0.03, 0.40
WP STAR x Non-work stressor	-0.03	-0.09, 0.03	-0.02	-0.14, 0.09	-0.18	-0.44, 0.08
Random effects Variance intercept	0.02 <sup>***</sup>	0.01, 0.03	0.36 <sup>***</sup>	0.28, 0.49	0.51 <sup>***</sup>	0.38, 0.73
Variance residual	0.06 <sup>***</sup>	0.06, 0.07	0.21 <sup>***</sup>	0.19, 0.22	1.11 <sup>***</sup>	1.03, 1.97

<sup>a</sup>Reference = women.<sup>b</sup>Reference = non-white.<sup>c</sup>Reference = college graduate.\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$

**Table 5**

Effects of the STAR Workplace Intervention on Affective and Physical Reactivity to Interpersonal Stressors

	Negative Affect (N = 1,210 days)		Positive Affect (N = 1,208 days)		Physical Symptoms (N = 1,210 days)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Fixed effects Intercept	1.36	1.27, 1.44	2.82	2.56, 3.08	1.37	1.00, 1.74
Burst	0.00	-0.04, 0.03	0.13***	0.06, 0.21	0.10	-0.28, 0.07
Gender <sup>a</sup>	0.01	-0.05, 0.04	-0.14	-0.39, 0.10	0.26	-0.05, 0.58
Age	0.00	-0.00, 0.01	0.02*	0.00, 0.05	0.02	-0.00, 0.05
Race <sup>b</sup>	-0.02	-0.09, 0.05	-0.04	-0.31, 0.22	-0.05	-0.38, 0.29
Education <sup>c</sup>	0.05	-0.03, 0.13	-0.15	-0.45, 0.16	0.01	-0.38, 0.39
Schedule control	-0.02	-0.06, 0.02	0.15	-0.02, 0.32	0.01	-0.20, 0.23
Merger	0.03	-0.03, 0.09	0.03	-0.27, 0.22	0.16	-0.15, 0.47
Hours worked	0.00	-0.01, 0.00	0.03*	0.01, 0.05	0.01	-0.01, 0.04
Average stressors	0.14***	0.10, 0.18	0.02	-0.06, 0.10	0.63***	0.46, 0.78
WP STAR	-0.03	-0.10, 0.04	-0.03	-0.16, 0.06	-0.24	-0.55, 0.06
Interpersonal stressor	0.14***	0.08, 0.20	-0.04	-0.16, 0.06	0.19*	0.05, 0.44
WP STAR × Interpersonal stressor	-0.02	-0.05, 0.09	-0.02	-0.15, 0.11	-0.28	-0.57, 0.01
Random effects Variance intercept	0.02***	0.01, 0.03	0.37***	0.28, 0.52	0.52***	0.38, 0.74
Variance residual	0.06***	0.06, 0.07	0.20***	0.19, 0.22	1.10***	1.03, 1.18

<sup>a</sup>Reference = women.<sup>b</sup>Reference = non-white.<sup>c</sup>Reference = college graduate.\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$

**Table 6**

Effects of the STAR Workplace Intervention on Affective and Physical Reactivity to Non-interpersonal Stressors

	Negative Affect ( <i>N</i> = 1,210 days)		Positive Affect ( <i>N</i> = 1,208 days)		Physical Symptoms ( <i>N</i> = 1,210 days)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Fixed effects						
Intercept	1.30	1.23, 1.37	2.80	2.56, 3.05	1.29	0.94, 1.64
Burst	0.00	-0.03, 0.05	0.13***	0.06, 0.21	0.10	-0.28, 0.07
Gender <sup>a</sup>	0.01	-0.05, 0.07	-0.14	-0.39, 0.10	0.26	-0.05, 0.58
Age	0.00	-0.01, 0.01	0.02*	0.00, 0.05	0.02	-0.00, 0.05
Race <sup>b</sup>	-0.02	-0.09, 0.04	-0.04	-0.31, 0.22	-0.05	-0.39, 0.28
Education <sup>c</sup>	0.06	-0.02, 0.13	-0.15	-0.45, 0.16	0.03	-0.35, 0.41
Schedule control	-0.01	-0.05, 0.03	0.15	-0.02, 0.32	0.04	-0.17, 0.25
Merger	0.02	-0.03, 0.09	0.03	-0.22, 0.28	0.14	-0.17, 0.45
Hours worked	0.00	-0.01, 0.00	0.03*	0.01, 0.05	0.01	-0.01, 0.04
Average stressors	0.13***	0.10, 0.17	0.02	-0.06, 0.10	0.63***	0.47, 0.79
WP STAR	-0.07*	-0.13, -0.01	-0.08	-0.19, 0.04	-0.20	-0.47, 0.06
Non-interpersonal stressor	0.09***	0.04, 0.14	-0.09*	-0.19, -0.01	0.13	-0.09, 0.35
WP STAR × Non-interpersonal stressor	-0.08**	-0.14, -0.02	-0.05	-0.16, 0.07	-0.26*	-0.52, -0.01
Random effects						
Variance intercept	0.02***	0.01, 0.03	0.36***	0.27, 0.49	0.52***	0.38, 0.74
Variance residual	0.06***	0.06, 0.07	0.21***	0.19, 0.22	1.11***	1.03, 1.19

<sup>a</sup>Reference = women.<sup>b</sup>Reference = non-white.<sup>c</sup>Reference = college graduate.\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$