Changing Work and Work-Family Conflict in an Information Technology Workplace: Evidence from the Work, Family, and Health Network*

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Research suggests that schedule control and supervisor support for family and personal life are key work resources for managing work-family conflict, but existing data and designs have made it difficult to identify the effects of these resources. This analysis utilizes a group-randomized trial in which some units in an information technology (IT) workplace participated in an initiative designed to modify the social environment of the workplace. We find statistically significant, though modest, improvements in employees' work-family conflict and larger changes in schedule control and supervisor support for family and personal life. We find no evidence that this intervention increased work hours or perceived job demands and subgroup analyses suggest the intervention brings greater benefits to those employees with greater need. [Note: This paper is being submitted along with others from the Work, Family, and Health Study.]

Keywords

work-family conflict, work, family, experiment, group-randomized trial

Changing Work and Work-Family Conflict in an Information Technology Workplace: Evidence from the Work, Family, and Health Network

Scholars have long argued that paid work is organized in ways that assume workers are unencumbered by other responsibilities and willing and able to devote themselves primarily to their jobs (Acker 1990, Hochschild 1975). These expectations arose when more employees, and certainly ideal workers, had someone – a wife – at home to take care of household tasks, children, aging parents, and the everyday reproductive labor of feeding, clothing, and otherwise preparing the worker to return to work (Kanter 1977, Williams 2000). The institutionalized expectations in U.S. workplaces are that serious, committed, promotable employees will work full-time, full-year, on a set schedule determined by the employer, and put in long hours (especially among professional and managerial workers), with no significant breaks in employment (Moen and Roehling 2005).

These expectations foster work-family conflict for the many employees who have significant caregiving responsibilities for children, dependent adults, or aging parents, but also for the growing proportion of workers who face fewer family demands but do not have a spouse at home to take of all the "little things" that still need to be done. In 2011, only 25.4 percent of U.S. family households with children under 18 were made up of one employed spouse and a spouse who was not employed (Calculated from Table 4, BLS 2012) and these parents with a traditional division of labor made up only 11.1 percent of all households in the U.S. Because men and women still do not contribute equally to household and caregiving work (Bianchi et al. 2000, Hook 2010, Sayer, Cohen, and

Casper 2004) and because cultural expectations encourage mothers to scale back at work and fathers to pursue the breadwinner identity (Hays 1996, Townsend 2002), the organization of paid work reinforces gender inequality (Acker 2006, Budig and England 2001, Cha 2010, Glass 2004, Rapoport et al. 2002, Ridgeway and Correll 2004, Risman 2004, Turco 2010).

Scholars and advocates interested in reducing work-family conflict and promoting gender equality have therefore looked to changing the organization of work. The available research suggests that both flexibility and support seem to be key work resources that help employees minimize work-family conflict. Before reviewing those studies, we clarify our understanding of both of these concepts. Because flexibility is sometimes seen as a management strategy referring to employers' ability to eliminate workers or rely on contingent staff rather than regular employees, we prefer the more specific term of schedule control to refer to employees' control over the timing of their work, the number of hours they work, and the location of their work (Berg et al. 2004, Kelly, Moen, and Tranby 2011, Schieman, Milkie, and Glavin 2009). Social support also has several meanings but work-family researchers have investigated supervisors' support as reported and experienced by employees (Hammer et al. 2009). Specifically, we investigate supervisor support for family and personal life because a recent meta-analysis finds this form of support is more closely tied to work-family conflict and related outcomes than general measures of supervisor support (Kossek et al. 2011).

While a substantial number of studies link schedule control and supervisor support to work-family conflict and related outcomes (as we review below), the causal

claims that can be made from this literature are limited. The vast majority of studies investigating these relationships are cross-sectional and observational, in other words, nonexperimental (Bianchi, Casper, and King 2005). Research on "family-friendly" policies and benefits also has been primarily cross-sectional, so it is also unclear whether employees whose workplaces adopt new work-family initiatives actually see increased schedule control and supervisor support or decreased work-family conflict (Kelly et al. 2008). These design limitations are serious because research suggests that employees have differential access to schedule control, supervisor support, and organizational work-family policies, with clear variation by education and occupational status (Davis and Kalleberg 2006, Deitch and Huffman 2001, Golden 2008, Ryan and Kossek 2008, Schieman et al. 2009, Swanberg et al. 2011, Weeden 2005).

Given existing data and study designs, it has been difficult to identify the effects of work resources and workplace policies because the associations seen in the cross-section may reflect, at least in part, the selection of educated and otherwise privileged employees – who have more economic and social resources for managing family responsibilities generally – into more generous workplaces. In other words, those with higher human capital and social capital are more likely to be hired into "good jobs" with "good employers" and more likely to successfully negotiate with their supervisors for more control over their work hours because of their leverage in the labor market (Wharton, Chivers, and Blair-Loy 2008, Weeden 2005); these selection processes have made it difficult to identify the effects of specific work conditions on work-family conflict with confidence.

The current analysis supports stronger causal claims by drawing on a field experiment to investigate the effects of a workplace initiative on the work environment and employees' experience of the work-family interface. Specifically, we report on a group-randomized trial in which some work units received an intervention (i.e., a new workplace initiative that represents the experimental treatment) while other units continued with "business as usual" policies and practices. We evaluate the effects of this workplace intervention in the information technology (IT) division of a high-tech Fortune 500 organization in the central United States; our pseudonym for the company is TOMO. The intervention is called STAR, short for "Support. Transform. Achieve. Results." STAR aims to modify the psychosocial work environment, specifically targeting employees' schedule control and supervisors' support for family and personal life, with the goals of reducing work-family conflict and promoting employee health.[1] While most work-family policies, like flextime and telecommuting arrangements, allow some (select) employees to change their work patterns with the permission of their managers, we argue that broader organizational changes require reaching both employees and supervisors whose everyday practices and interactions generally reinforce the existing expectations and norms regarding ideal workers in that setting. This analysis investigates the effects of STAR on technical and professional workers' sense of schedule control and supervisor support for family and personal matters and on the work-family interface itself, including work-to-family conflict, family-to-work conflict, perceived time adequacy (having "enough" time for family and personal responsibilities).

To preview our results, we find statistically significant increases in the work resources – schedule control and supervisor support for family and personal life – theorized to affect work-family stress and to employee health and well-being and significant, though modest, improvements in employees' work-family conflict over a six month period. We also find that employees with greater apparent need for these changes in the workplace, as measured by their family demands and limited supervisor support at baseline, benefit more from the intervention than others. Recent research has suggested that schedule control further blurs the boundaries between work and nonwork in ways that may encourage longer and more intensive work (especially among salaried, professional workers), but we find no evidence that the intervention increased work hours or psychological job demands. In sum, this study contributes to the larger sociological literature on social structures and individual well-being by using an experimental design that allows causal conclusions to be made about the effectiveness of an intervention changing the work environment. We know of no other experimental evaluations of workplace interventions that aim to change norms, expectations, and practices at work in order to reduce work-family conflict, but such evaluations are key to identifying whether and which work conditions affect work-family conflict.

CHANGING WORK TO REDUCE WORK-FAMILY CONFLICT

Previous Research and Its Limitations

Many studies have considered the relationship between specific work resources and work-family conflict and related outcomes. Employees who report more control over

their schedules have lower work-family conflict (Byron 2005, Galinsky, Bond, and Friedman 1996, Galinsky, Sakai, and Wigton 2011, Galinsky et al. 2011, Hammer, Allen, and Grigsby 1997, Kossek, Lautsch, and Eaton 2006, Moen et al. 2008, Roeters et al. 2010, cf. Schieman , Milkie, and Glavin 2009Swanberg et al. 2011,) and better work-life balance (Hill et al. 2001, Tausig and Fenwick 2001). Employees who report more support from supervisors – particularly with regard to work-family issues – also report lower work-family conflict (Allen 2001, Batt and Valcour 2003, Frone, Yardley, and Markel 1997, Frye and Breaugh 2004, Hammer et al. 2009, Kossek et al. 2011, Lapierre and Allen 2006, Thomas and Ganster 1995, Thompson, Beauvais, and Lyness 1999) and believe their organizations to be more helpful with work-family balance (Berg, Kalleberg, and Appelbaum 2003). Since supervisors typically facilitate or limit employees' access to flexible work options such as flextime or remote work, schedule control and supervisor support for family life are often related (Blair-Loy and Wharton 2002, Hammer et al. 2007, Kelly and Kalev 2006).

We identify two major concerns regarding this body of research. First, as noted above, the vast majority of these studies are cross-sectional and observational or nonexperimental, and so do not fully support causal claims. The apparent negative associations between schedule control and work-family conflict and between supervisor support for family and personal life and work-family conflict may reflect the fact that employees who have made it into positions where they enjoy those work resources are also benefiting from higher incomes, higher occupational status, and perhaps fewer family demands because they are more likely to have spouses who are not employed,

have fewer children, and the adults they care for may have more economic and social resources themselves. In other words, employees with more schedule control and supervisor support very often have more financial and social resources to avoid work-family conflicts and fewer family demands as well. Note, though, that the work-family literature finds that employees in these "good" jobs are often working longer hours, facing higher job demands, and more psychologically involved in their paid work; the "stress of higher status" helps explain the higher work-to-family conflict reported by those employees in some studies (Schieman, Whitestone, and Van Gundy 2006; Schieman, Milkie, and Glavin 2009). Previous cross-sectional studies examining work-family conflict have generally controlled for work hours (and less often controlled for job demands or psychological involvement) when investigating schedule control and supervisor support but a stronger design would attempt to manipulate those work resources while holding work demands constant, as we do in this study. Additionally, the apparent associations between these work resources and work-family conflict in cross-sectional studies may be spurious because respondents with greater negative affect may rate both their workplaces and their experience of the work-family interface more negatively than others (Bruck and Allen 2003, Watson 1988). Longitudinal data on the same respondents provide stronger evidence of the effects of changes in the work environment on changes in the work-family interface.

Even if we accept that increased schedule control and supervisor support for family and personal life would reduce work-family conflicts, the second concern with the existing literature is that it does not provide clear guidance on how to foster those work

resources. Research on some of the most common work-family policies in U.S. organizations suggests that these initiatives (or interventions, using the terminology we apply to STAR) do not necessarily increase schedule control or supervisor support for family and personal life. Flextime and telecommuting policies may be formally available in a given organization, but much research suggests that employees' ability to use those arrangements varies according to their occupational status and their managers' preferences or whims (Blair-Loy and Wharton 2002, Eaton 2003). Furthermore, in most organizations, these flexible work arrangements are not fully institutionalized as acceptable and legitimate options for organizing one's work but are treated as individual accommodations for valued employees (Kelly and Kalev 2006). When managers decide who gets what schedule and who gets to use flexible work arrangements, employees may not feel they have much control over their schedules and these policies may not be associated with lower work-family conflict (Batt and Valcour 2003, Tausig and Fenwick 2001).[2]

Because research suggests that flextime and telecommuting policies do not necessarily increase employees' sense of control over their schedules or improve the work-family interface, scholars – as well as practitioners – have argued that making significant changes in employees' lives requires real changes in organizational cultures (Lewis 1997, Mennino, Rubin, and Brayfield 2005, Thompson et al. 1999). We know that flexible work policies, on their own, are not sufficient but it is less clear what changes would produce a more flexible, supportive, and truly family-friendly culture. The

research on organizational culture initiatives is limited but growing (Bailyn, Collins, and Song 2007, Callan 2007, Kelly et al. 2010, Perlow 1997, Perlow 2012). This study involves a rigorous evaluation of one such effort and so contributes to that nascent literature.

While the problem with regard to fostering schedule control is the limited efficacy of the workplace policies that are now common, the issue with regard to fostering supervisor support for family and personal life is that there are few interventions available and even less research investigating their effects. Management training would seem to be a viable option, but scholars first needed to identify what behaviors constitute and convey supervisor support for family and personal life in order to design appropriate training (Hammer et al. 2007). Scholars have long recognized the critical role of supervisors in interpreting policies and acting as gatekeepers to use of flexible work and family leave policies (Albiston 2005, Blair-Loy and Wharton 2002, Hochschild 1997, Kossek, Barber, and Winters 1999) but only recently have researchers identified other dimensions of supervisor support for family and personal life. These include providing emotional support, sharing how one handles work-family challenges, and looking for creative solutions that meet the needs both employees and the organizations (Hammer et al. 2007, Hammer et al. 2009). In the next section, we describe the one study we know of that systematically evaluates the effects of a training intervention to increase supervisor support for family and personal life.

Recent Studies of Workplace Interventions

Building on the cross-sectional research on schedule control and supervisor support for family and the work-family interface, two recent quasi-experimental intervention studies provide the strongest evidence to date regarding the effects of these work resources. These two studies also investigated new workplace interventions that targeted either schedule control as part of an organizational culture change or training to increase supervisor support for family and personal life. By taking advantage of a phased roll-out of a "culture change" initiative called the Results Only Work Environment (ROWE) at the corporate headquarters of Best Buy, Co., Inc. , Kelly, Moen, and Tranby (2011) showed that employees in departments participating in ROWE in the study period saw increased schedule control and improvements in the work-family interface (i.e., reduced work-family conflict, reduced negative spillover from work to home, increased work-family fit) as compared to the changes reported by employees in departments that continued operating in traditional ways. Employees in ROWE departments also reported increased time adequacy based on reports of having "enough" time to be with family, be involved in the community, and take care of themselves (Kelly et al. 2011). A related study found that ROWE employees had improved health behaviors (e.g., sleep before work days, reporting they would go to the doctor when sick) as compared to employees in traditional departments (Moen et al. 2011). These findings point to the possible benefits of broad workplace initiatives targeting schedule control – as opposed to individually negotiated flexible work options – but the study did not involve randomization of "treatment" (departments' participation in ROWE) and the intervention

and control groups were not fully equivalent at baseline characteristics (Kelly et al. 2011).

Second, Hammer, Kossek, Anger, Bodner, and Zimmerman (2011) evaluated the impact of an intervention targeting supervisors' support for family and personal life in 12 grocery store sites. Employees in stores where supervisors received training on how they could demonstrate support for employees' family and personal lives and engaged in a self-monitoring activity to help translate that training into practice were compared to those in control stores. The outcomes of this study were employees' self-reported physical health, job satisfaction, and turnover intentions. Work-family conflict was investigated as a moderator of the intervention effects, rather than a primary outcome as is the case here. Hammer and colleagues found that employees with high family-to-work conflict at baseline who worked in stores that went through the training reported higher levels of job satisfaction and physical health and lower turnover intentions than similar employees in control stores, while employees who began with low levels of family-to-work conflict reported lower job satisfaction and physical health and higher turnover intentions than similar employees in stores not going through training (Hammer et al. 2011:141). The authors note that the intervention may have created a negative backlash among those who did not feel company resources were being used in ways that would benefit them, and also that supervisors may have concentrated their demonstrations of support on those with high family-to-work conflict, frustrating other employees and contributing to declines in job satisfaction and increases in turnover intentions (Hammer et al. 2011:142). This study demonstrated the value of training targeting supervisors'

support for family and personal life, suggesting that work-family "interventions may be most effective for those most in need" (Hammer et al. 2011: 147).

INTERVENTION OVERVIEW

Integrating the interventions from the two studies described above, the STAR intervention was designed to target both schedule control and supervisor support for family and personal life. We first describe what was involved in STAR and then compare it to other work-family initiatives and workplace interventions as they are studied in other fields. STAR included (1) participatory work redesign activities that identify new work practices and processes to increase employees' control over work time while still meeting business needs and (2) supervisory training about strategies to demonstrate support for employees' personal and family lives while also supporting employee job performance. The STAR intervention as implemented in TOMO included eight hours of participatory sessions for employees and an additional four hours for managers.[3] Participatory sessions were customized and updated versions of the ROWE sessions studied in Best Buy Inc., Co., Inc. (Kelly et al. 2010, Ressler and Thompson 2008). Training sessions were both highly scripted and very interactive. Structured messages were presented to all, but participants responded differently to activities and role plays and different work groups chose to focus on different changes to implement. STAR encouraged employees and managers to individually and collectively enact new ways of working that increase employees' control over their work time and demonstrate greater support for personal and

family life. For example, employees and managers together discussed how, when, and where they would like to work, how they could coordinate and communicate if hours were more varied and more employees worked remotely, and what everyday practices and interactions would need to change to support working in these new ways (e.g., setting up call-in numbers for staff meetings, clarifying tasks so "face time" is not used to evaluate productivity or commitment, not relying on stopping by a coworker's cube to get a question answered). Employees and managers were also invited to participate in behavior tracking activities, such as reporting on their early experimentation with new ways of working on a STAR blog set up on an internal company website.

Managers also completed a self-paced, computer-based training lasting about an hour and two periods of behavior tracking in which the manager set a goal for exhibiting supportive behaviors over the coming week and then was reminded by alarms to log those behaviors in an iPod touch. The computer-based training and self-monitoring activities were customized for this study population from those implemented in the Hammer et al. (2011) study in grocery stores by including a short video of a TOMO executive endorsing the initiative, preparing specific examples of supervisor support for family and personal life that were salient to TOMO employees, and moving to the iPod touch delivery of the behavior tracking activities.

Compared to most work-family initiatives (like flextime policies, telecommuting agreements, or family leaves), STAR is different in its collective approach. Rather than individual employees having access to a flexible schedule or telecommuting agreement based on their manager's approval of a request (Blair-Loy and Wharton 2002, Briscoe

and Kellogg 2011), groups of employees were randomized to STAR or to the control condition. This shift away from an "accommodations" framework, where some employees are allowed to change their work practices but the norm of standard work hours and work location remains, was theorized to be an essential component of an intervention targeting the expectations, norms and practices that reinforce the ideal worker norm (Kelly et al. 2010, Kossek et al. 2011).

STAR's collective approach is consistent with pioneering action research that utilizes collective dialogues to reevaluate work processes in the hopes of advancing both the organization's goals and facilitating better work-personal life fit (Bailyn 2011, Perlow 1997, Perlow 2012, Rapoport et al. 2002). However, our randomized experimental design allows for a more rigorous evaluation of the initiative than has been possible in those studies and STAR pairs bottom-up changes identified by employees with training to support managers as well. The participatory approach utilized in STAR is increasingly common in occupational health interventions, which often involve participatory work redesign to increase control and support and reduce job stress (e.g., Randall and Nielsen 2010, Semmer 2006) but generally ignore work-family issues. A systematic review of the job stress literature concluded that interventions that targeted both the individual and organizational level were most effective, compared with those that only target individuals or organizations (LaMontagne et al. 2007). STAR has this multi-level targeting of individuals, since employees can make customized changes in their work practices, and the organizational culture more broadly. Workplace interventions are also classified as primary, secondary, or tertiary by occupational health scholars (LaMontagne et al. 2007,

Randall and Nielsen 2010). Primary interventions aim to prevent exposure to unhealthy environments (such as workplace stressors) by changing workplace policies, practices, or processes; secondary interventions attempt to help individuals respond better to stressors; and tertiary interventions involve treatment for employees who are already experiencing symptoms or illnesses related to workplace exposures. Consistent with a call for work-family research that helps change the workplace rather than the workers (King et al. 2012), STAR represents a primary, preventive intervention that aims to reduce exposure to stressful conditions rather than help employees cope with or recover from them.

RESEARCH QUESTIONS AND HYPOTHESES

We investigate four broad research questions and discuss related hypotheses and the literature supporting those expectations.

(1) Does STAR increase employees' schedule control and their reports of supervisor support for family and personal life?

(2) Does STAR improve employees' experience of the work-family interface? Specifically, does STAR reduce work-to-family conflict and family-to-work conflict and increase perceived time adequacy among TOMO employees at six-months follow up?

Previous studies of workplace initiatives have not been designed to answer these questions conclusively due to their nonexperimental and nonrandomized design. We hypothesize that STAR will increase schedule control, employees' perceptions of their supervisors' support for family and personal life, and time adequacy, and that STAR will reduce work-family conflict in both directions. Following the literature, we conceptualize

work-to-family conflict and family-to-work conflict as the degree to which role responsibilities from one domain are perceived as interfering with responsibilities in the other domain (Greenhaus and Beutell 1985, Netemeyer et al. 1996). Changes in the work environment may be more salient for work-to-family conflict but family-to-work conflict may decrease as expectations shift within the workplace (e.g. coming in to work later due to a school appointment is no longer experienced as a problem).

Despite our hypotheses, there are several reasons to expect STAR might have no or very limited effects. First, randomized controlled studies of many other organizational interventions – especially those trying to redesign work practices or processes – have often not found statistically significant effects (Semmer 2006, van der Klink et al. 2001). STAR critiques past management practices such as managers setting schedules, rewarding "face time" or visibility, and expecting employees to drop personal concerns while they are at work. Resistance to these changes might arise from both managers and employees who have invested in building careers under the old expectations, as has been seen in other participatory management initiatives (Vallas 2003, Smith 2001).

Second, the pilot study of ROWE in Best Buy found positive effects of that initiative (Kelly et al. 2011, Moen et al. 2011), but there are several reasons that a randomized evaluation of a similar initiative might not find changes in another organization. ROWE was "homegrown" within the company and therefore customized to that organizational culture and workforce. The ROWE facilitators were internal human resources staff at the time and had tacit knowledge of the organizational culture and management politics in that setting. STAR, in contrast, was brought into the organization

and delivered by outside consultants.[4] Additionally, STAR was implemented in TOMO as a pilot program with the clear understanding that top executives were not ready to adopt it across-the-board. In this study, work units were randomized to STAR or "usual practice" conditions. Some employees and mid-level managers in STAR may have believed that the executives just above them were not supportive of these changes and therefore were cautious about the initiative. In the Best Buy roll-out, employees whose departments moved into ROWE knew executives above them were at least open to the changes and so may have responded more positively themselves.

Third, the pilot study of manager training to increase supervisor support for family and personal life in grocery stores did not evaluate the effects of training on work-family conflict but instead considered work-family conflict as a moderator of the intervention effects on other work and health outcomes (Hammer et al. 2011). It is unclear whether the STAR initiative, which included similar training encouraging managers to be more sensitive to family and personal life, will reduce work-family conflicts among employees.

Finally, during the course of the study, it was announced that TOMO would be acquired by another firm (with the merger finalized after the follow-up data analyzed here). This reflects the reality of conducting field trials, in that all conditions could not be controlled. The merger announcement could well have raised questions for TOMO employees about whether the current organizational culture would be sustained into the future, leading some to question whether STAR could create a more flexible and

supportive workplace in the context of this larger organizational change. Employees facing organizational restructuring often feel that any changes in work practices are suspect or unwise (Egan et al. 2007, Olsen et al. 2008).

(3) Does the STAR initiative make conditions worse for employees by increasing their work hours or job demands? Such unintended consequences might arise due to the increased permeability of work and nonwork across time and space and the resulting blurring of work and family roles that it facilitates (Chesley 2005, Glavin and Schieman 2010, Kelliher and Anderson 2010, Schieman and Glavin 2008). In other words, employees may gain more control over when and where they work but simultaneously find themselves working more or feeling more work pressure. Schedule control may be especially likely to increase work hours or work demands for a salaried, professional workforce like this one, where the employer does not pay overtime (so the employer has an interest in getting as many hours of work as possible) and where employees' devotion to work is both expected and experienced as intrinsically rewarding (Blair-Loy 2003, 2009; Perlow 2012). Work intensification may negatively affect the work-family interface in the short run and might also have implications for employees' health and well-being in the future.

(4) Do the effects of STAR differ depending on employees' need, as indicated by family demands and their work environment at baseline? In other words, are there heterogeneous treatment or intervention effects? We investigate whether STAR differentially benefits those who seem to have the greatest need for it at baseline. Employees who have children living at home and those providing care for elderly relatives or other dependent adults

presumably have greater work-family strain and a greater need for a flexible, supportive work environment (Michel et al. 2011, Moen et al. 2012; cf. Schieman et al. 2009). As noted above, family responsibilities are gendered, with mothers and wives often doing significantly more. Also, work-family strains seem to weigh more heavily on mothers' well-being than fathers (Nomaguchi, Milkie, and Bianchi 2005) and there is some evidence that mothers feel the weight of normative judgments even when they are viewed as high performers at work (Benard and Correll 2010). This suggests that mothers and fathers may benefit differently from STAR, although it is an open question whether mothers will benefit more (because their needs may be greater) or fathers will benefit more (because their work-family needs were not previously recognized or they had not pursued more traditional, marginalized flexible work options).

We expect that employees who report low levels of schedule control at baseline and those who describe their supervisors as less supportive of their family and personal lives will benefit more from STAR. As we describe below, there was wide variation in employees' schedule control at baseline, depending on their manager's preferences and decisions about variable work schedules and routine off-site work. STAR may "level the playing field" by raising these employees' sense of schedule control and supervisor support to match that reported by their peers whose supervisors had previously been flexible and supportive. Employees who work very long hours may also have a greater need for this workplace initiative, but it is an open question as to how increased schedule control and supervisor support – the work resources hypothesized to ameliorate work-

family conflict – stack up against high work demands in the form of very long work hours (Blair-Loy 2009, Kelly et al. 2011, Schieman et al. 2009).

We also hypothesize that employees with higher levels of work-to-family and family-to-work conflict are in more need of the intervention and therefore might accrue more benefits from it, as suggested by the moderated findings in the Hammer et al. (2011) intervention study. Employees with high conflict at baseline may receive more benefit in part because they have more room for improvement than those with low work-family conflict. STAR may be more salient and attractive to employees with high work-family conflict, even though the initiative is not presented to employees explicitly as a work-family initiative.

A related question is whether employees with less obvious work-family needs end up taking up the slack for those who benefit from STAR. Perhaps parents and adult caregivers benefit, in terms of reduced work-family conflict, but some of the burden shifts to those with whose nonwork obligations are less or less obvious. If this is the case, employees with no dependents may experience more work-family conflicts under STAR or begin working longer hours or more intensely as their peers take advantage of the initiative. The popular and business press are certainly attuned to the possibility of work-family backlash prompted by singles and those without dependents taking on even more work as parents and adult caregivers attend to work-family conflicts (e.g., "Are You Too Family Friendly?" by Wells 2007, Shellenbarger 2012). There is little academic research on the differential impact of work-family policies or initiatives on singles or those with no dependents (cf. Casper, Weltman, and Kweisga 2007) but the intervention study in

grocery stores conducted by Hammer, Kossek, and colleagues (2011) suggested that employees with less family-to-work conflicts themselves experienced those workplace changes negatively.

USING GROUP RANDOMIZED TRIALS TO INVESTIGATE SOCIAL ENVIRONMENTS

This study has implications well beyond work-family scholarship or the study of work organizations and employee well-being. Sociologists as well as other social scientists have turned their attention to randomized experiments in conjunction with a revived commitment to causal inference and counterfactual thinking (Gangl 2010, Morgan and Winship 2007, Winship and Morgan 1999). Yet, sociologists have rarely conducted group-randomized trials (GRTs, also called cluster randomized trials or place-based experiments) – the very experiments that would help identify the effects of social environments or social structures more conclusively (Cook 2005, Oakes 2004). While some recent educational research uses group-randomized trials to examine innovations in schools (e.g., Borman et al. 2007, Cook et al. 2000, Raudenbush et al. 2007), sociologists of work and organizations have not yet pursued group-randomized trials to investigate the effects of specific workplace policies or initiatives on employees and the organization itself.

Group-randomized trials are becoming more common in other fields, including occupational health studies of workplace initiatives (Landsbergis et al. 2011, van der Klink et al. 2001). In some cases, GRTs involve group randomization simply to achieve

"economies of spatial concentration" by reaching many of the target group and by leveraging existing communication channels for reaching that group (Bloom 2006:120-1). In those studies, the intervention target is individual behavior change and randomization occurs at the group level primarily for convenience and ease of intervention delivery. For example, when workplace-based smoking cessation interventions randomize at the workplace level, they do so for ease of delivering smoking cessation messages and activities to individuals within those site and in order to avoid contamination of intervention activities into control groups (e.g., Okechukwu et al. 2009, Sorensen et al. 2002). Other GRTs aims to "induce organizational change" such as "whole-school reforms" and employer-based initiatives that invited change in policies, practices, or structures (Bloom 2006). Randomizing individuals is not sensible or feasible with an intervention that targets the organization or jointly targets individual change and organizational change (as does STAR). Within the work-family field (and within sociology, in general), there are only a few randomized trials and almost no group-randomized trials. Most randomized studies of work-family interventions have targeted employees' coping and parenting skills with interested individuals randomized to the intervention or a wait-list control (Hartung and Hahlweb 2010; Martin and Sanders 2003); these constitute tertiary, rather than primary, interventions because they do not attempt to modify the work environment. One exception is a group-randomized trial of self-scheduling among teams of nurses in a Danish hospital that we would identify as a primary intervention because it changes workplace practices in hopes of improving work-life fit (Pryce et al. 2006).

One inspiring field experiment that has received substantial attention is Moving To Opportunity (MTO), which attempted to change families' exposure to high-poverty environments by randomizing interested residents of public housing to either receive housing vouchers that had to be used in a lower poverty neighborhood, receive housing vouchers that could be used in any neighborhood, or receive no vouchers and continue in current housing (e.g., Clampet-Lundquist et al. 2011, Katz et al. 2001, Sampson 2008). MTO attempted to identify the effects of social environments by randomizing individuals to move into a different neighborhood. In contrast, our study attempts to change the social environment, within the workplace, of people still assigned to the same jobs and interacting within the same coworkers and managers. STAR attempts to change employees' psychosocial work environments by encouraging employees and supervisors who work together to reevaluate their assumptions, expectations, and everyday interactions and practices regarding when, where, and how work is done in order to increase employees' control, rather than managerial control, of work time and provide more explicit support for family and personal life.

METHODS

Research Site

This field experiment was conducted in the information technology (IT) division of a large, high-tech organization. Company representatives reported that their organization was viewed as fairly traditional, in terms of policies and corporate culture, for an IT workplace. Executives within the IT division and their human resources

partners hoped to do something innovative but evaluate it carefully. The analytic orientation of the IT leadership made the study's implementation and evaluation of the new program attractive to these decision-makers. We selected this organization from possible industry partners based on the requirements of the study design: multiple work units sufficient to support random assignment, with appropriate numbers of employees within each unit. Final decision criteria included geographic proximity to minimize study personnel travel distance between locations, site and workforce stability to support the research for the study duration, and specific endorsement from the industry partner leadership to support all research activities.

This organization exhibited fairly traditional expectations for employees, who attempted to prove themselves as serious, dedicated, and committed by working long hours when the project required it, prioritizing work over family, pursuing uninterrupted professional careers and the tenure associated with that, and traveling or relocating as requested (Moen and Roehling 2005, Williams 2000). Historically, employees who did well in the organization received generous benefits and good wages in return. But work conditions had changed in important ways over the last decade, challenging the social contract between the organization and its workers. The firm increasingly relied on contractors; as a result, the employee workforce is older than might be expected (see Table 1 below) and even those employees hired recently often have longer tenure than is officially recorded because they worked as contractors before being hired into the regular workforce. As the organization grew and technology changed, staff increasingly relied on technology to coordinate projects; many work groups are not "co-located" in the same

building, city, or state. Then, beginning around 2005, TOMO IT began working closely with off-shore employees and contractors. The programming and testing process is now supposed to follow a 24/7 model, in which tasks "follow the sun" and are completed by the U.S. staff during their day and then passed back to the off-shore (primarily Indian) staff for the next stage of work. The need for coordination with off-shore workers meant that many IT employees in the U.S. are expected to be available for urgent questions (if paged at night) and routinely participate in early morning conference calls reviewing the work just performed. In response to these changes in management strategy, work processes were changing in ways that would seem to create more flexibility in when and where work is done. The majority of employees reported they did some work at home and approximately 20 percent of employees had a supervisor in a different state. Clearly, remote work and coordination across multiple time zones was happening – to greater or less degrees depending on managers' preferences – even before STAR was introduced to some groups. Our analysis examines whether effects were greater or smaller depending on baseline schedule control and supervisor support for family and personal life.

Randomization

The randomization process began by identifying groups of employees and managers who would be treated as "study groups" and randomized as a unit. Using company data on all IT employees and their managers in the two cities where data would be collected, 56 study groups were identified by the researchers in close coordination with company representatives. Some study groups are large teams of workers reporting to the same manager, while other study groups include multiple teams who either report to

the same senior leadership or work closely together on the same application. We refer to these units as *study* groups to denote that they are aggregations of work groups that already exist in the day-to-day reality of the organization. Findings reported below rely on analysis of the study groups (M=56 groups), but we also analyze the data at the work group level (M=120) as a robustness check.

Company representatives and our own formative work suggested that study findings would be discounted by some company insiders if all or most of the groups receiving the intervention were in a single job function, reported to any one vice president (VP), or represented particularly small or particularly large work groups. For example, if all the groups randomized to STAR happened to be software development teams, managers and employees in other job functions would likely view the findings of the study as irrelevant to their situation. We therefore decided on a randomization design that would ensure balance on job function, VP, and size of the study group. Because study groups might be affected by organizational restructuring (e.g., a work team and manager moved under a new VP or jobs were lost in a particular group), we developed an adaptive randomization scheme that allowed groups to be randomized near the beginning of their data collection instead of months in advance. We modified a biased-coin randomization technique (Frane, 1998) for use with group randomization (see Bray et al., under review, for details). The first four study groups were randomized using simple randomization and subsequent study groups were randomized using the adaptive randomization method.

Study Recruitment and Data Collection

Employees were eligible to participate in the study if they were located in the two cities where data collection occurred and were classified as employees, rather than independent contractors. Additionally, one study group whose employees are represented by collective bargaining agreements was excluded because of concerns that the group would not be able to fully implement the intervention if randomized to the intervention condition (because doing so might conflict with existing work rules). Recruitment materials emphasized the value of a study investigating the connections between employees' work, family, and health for the employees (who received some health information), the employing organization, and scientific knowledge more broadly. Trained site managers introduced the study to managers and employees and then handled questions during the data collection period. Recruitment materials emphasized the independence of the research team from TOMO and the strict confidentiality of individual data.

Due to concerns that employees in the control group would be less likely to participate in the study and a desire to keep researchers who were directly involved in data collection "blind" to study participants' condition (i.e., STAR or control), we distinguished the study from the STAR intervention. First, recruitment materials described the study goals as investigating how organizations' policies, practices, and culture affect the health and well-being of employees and their families, without reference to STAR. Second, STAR was rolled out as a company-sponsored pilot program with sessions and intervention activities conducted by personnel who were independent

of the data collection team. Field personnel were either involved in the core study's data collection or with STAR, but not both.

Computer-assisted personal interviews and health assessments were conducted by trained field interviewers at the workplace, on company time, at baseline and six months later. Employees were invited to complete a 60-minute survey and a 20-minute health assessment consisting of three blood pressure readings, height, weight, collection of blood spots, and wrist actigraphy. Participants were consented to each component of the data collection. Employees received a health feedback card with their average blood pressure reading, calculated BMI, and Hemoglobin A1c reading. Employees also received up to $60 (at each wave) for completing the interview, blood, and actigraphy components.

At baseline, 70 percent of eligible employees completed the baseline survey (N=823) and 87 percent of baseline participants completed the six-month follow-up (N=717). Figure 1 confirms that response rates are similar for employees in intervention and control conditions and that all study groups identified as eligible for the study were randomized and had at least some employees who participated in surveys. Using company data on basic demographics of all eligible employees, we investigated response bias with bivariate analysis. Women were significantly more likely to complete the baseline survey (77% vs. 66% for men), white employees were significantly less likely to participate (66% vs. 74% for nonwhite employees), and younger employees were significantly more likely to participate (mean age of 45.7 years for participants vs. 47.9 years for nonparticipants). We also compared the respondents who completed both

survey waves to the sample of 106 employees who completed baseline but not six months. We found that the Wave-1-only sample was significantly younger (mean age 43.34 vs. 46.03 among those who completed both waves) and reported significantly lower job demands (3.39 vs. 3.58 among those who completed both waves) at baseline. These samples did not vary significantly (at baseline) on schedule control, supervisor support, work-family conflict, time adequacy, work hours, other demographics, or STAR or control condition.

Analyses of the effects of STAR are conducted on the sample of respondents who completed both baseline and six-month surveys with the following exclusions. Fifteen employees who were randomized to the intervention condition but never invited to participate in any STAR sessions because of an error on the part of the research staff are excluded from this analysis; these employees constituted a portion of one study group but other work groups within that study group were invited to STAR. Additionally, eight employees are excluded because they were not randomized; due to restructuring, these employees began reporting to a manager already going through STAR and were oriented to STAR when they moved into that group. The resulting analytic sample consists of 694 employees nested in 56 study groups (mean size=15 employees, range of 3-45 employees). As noted below, models adjust for size of study groups at randomization.

The randomization process described above ensures the study groups allocated to intervention and usual practice are balanced on these specified characteristics (i.e., size of group, core or ancillary job function, VP organization) but we provide Table 1 to investigate the baseline values of work-family outcomes, perceived work environment,

demographics, and family demands of employees by condition, for 694 employees in the analytic sample. We do not present t-tests or chi-square tests because randomization will balance any differences, in expectation. We find very similar values for baseline levels of the outcomes investigated here (e.g., mean of 3.85 for supervisor support for family and personal life in both conditions). The samples are also balanced in other assessments of the work environment (e.g., means of 3.95 on a scale of role clarity in both groups), key demographics (e.g., mean age of 46.17 years and 45.88 years for STAR and control, respectively), and family demands (e.g., 23 percent providing care for an adult relative in each condition, 5 percent and 4 percent single parents). Table 1 reassures us that randomization worked to create comparable groups and therefore we can analyze the effects of STAR without needing to adjust for individual characteristics.

MEASURES

Work Resources and Work-Family Outcomes

Schedule Control is designed to measure the degree to which employees perceive they have control over their work time. It is an eight-item scale, with responses to each question ranging from 1 (*Very Little*) and 5 (*Very Much*), and was modified from the scale used by Thomas and Ganster (1995) 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?" and other items gauge control over taking time off and working at another location. *Family Supportive Supervisor Behaviors (FSSB)* is designed to measure employee perceptions of supervisors' behavioral support for family and personal life. It

is a separate construct from general supervisor support, in that some supervisors are supportive of employees doing their job, but not of employees' family concerns. We use a 4-item scale, with one question from each of four dimensions: emotional support, instrumental support, role modeling, and creative management, based on the original measure developed by Hammer and colleagues (2009). Responses range from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), and a sample question is: "Your supervisor works effectively with employees to creatively solve conflicts between work and non-work." For all scales, we impute missing values based on the mean of completed items in that scale for respondents who answered 75 percent or more of the questions in the scale (e.g., at least 4 out of 5 items). Appendix Table A provides the source, range, and reliability scores of all scales.

Work-to-Family Conflict and *Family-to-Work Conflict* outcomes are measured using scales developed and validated by Netermeyer, Boles, and McMurrian (1996). These scales are designed to reflect the degree to which role responsibilities from one domain are incompatible with the other. Examples of questions in the work-to-family conflict scale include "The demands of your work interfere with your family or personal time" and "Due to your work-related duties, you have to make changes to your plans for family or personal activities." Examples of questions for family-to-work conflict include "The demands of your family or personal relationships interfere with work-related activities" and "Family-related strain interferes with your ability to perform job-related duties." Both scales are the means of individual item responses ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). *Time Adequacy with Family* is based on two items asked

of all employees regarding their perceptions of whether they have had enough time on a regular basis during the past year to spend with their family and care for the needs of other family members (e.g., spouse, parents, in-laws). Employees responded to each on a 5-point scale (1 = *Never*, 5 = *All of the time*) and responses were averaged. These items were adapted from the Family Resource Scale-Revised by Van Horn and colleagues (2001).

Work Intensity Measures

Weekly Hours Worked is measured with a single question: "About how many hours do you work in a typical week in this job?" The mean at baseline is 45 hours, with 29 percent reporting working over 50 hours per week. *Psychological Job Demands* is a subscale of the Karasek and Theorell (1990) demands and control model of the psychosocial work environment. The subscale we use includes 3 items, with responses ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) to questions like "You do not have enough time to get your job done" and "Your job requires very fast work."

Variables used in Subgroup Analyses

Child at Home is an indicator of parents (or stepparents) with children under 18 living in their home at least four days per week. Both childless employees and parents with grown children or children who do not live in their homes are coded as *Child Not at Home*. We investigated different effects for mothers and fathers by interacting gender and *Child at Home* (n=121 mothers, 205 fathers). We also created four categories of family demands: *Child at home Only* (n=261) for those with children at home but no adult care

reported, *Care for Adults* for those reporting adult caregiving responsibilities at least 3 hours per week but no children under 18 at home, n=95), *Child at Home and Care for Adults* ("sandwich generation," n=65), and employees with *No Dependents* (n=273) reported. Those with no dependents are not all single households; they may have a spouse or an adult child living in the home but they do not report children under 18 or adult care responsibilities.

To assess whether employees reporting high work-family conflict or a less flexible and supportive work environment at baseline benefit more from STAR, we conducted additional subgroup analysis. We dichotomized work-to-family conflict such that those coded high reported means of 4 or higher ("agree" or "strongly agree") to statements about work interfering with family at baseline (n=147 vs. 547 low). We categorized employees as having low schedule control at baseline if their mean response was below 3,"very little" or "little" choice over one's schedule (n=122), and as having low supervisor support at baseline if their mean response was below 3, indicating "strongly disagree" or "disagree" to affirmative statements about the support their supervisor provides (n=84). Guided by other work-family scholarship (e.g., Schieman et al. 2009, Cha 2010), we compared employees working 50 or more hours (n=200) with those working fewer than 50 (n=494).

ANALYSIS

We estimate generalized linear mixed models (GLMM, using PROC MIXED in SAS) on repeated measures, with random effects for the level-2 unit nested in experimental condition, i.e., for study groups in STAR or usual practice. This is a

member cohort analysis, utilizing pre- and post- data on individuals nested in study groups (Murray 1998). We pursue random effects analysis because we are primarily interested in the effects of the intervention on individual employees rather than effects on the average characteristics of the study group.

Specifically, mixed models of the following form are used to assess the effect of the intervention on outcomes (bold face font indicates vector notation).

$$Y_{ij:k:l} = f(\beta_0 + \beta_1 C_l + \beta_2 T_j + \beta_3 T_j C_{jl} + \boldsymbol{\beta}_4 \mathbf{X}_{ij:k:l} + \boldsymbol{\beta}_5 \mathbf{RAND}_k + \boldsymbol{\gamma}_0 \mathbf{G}_{k:l} + \boldsymbol{\gamma}_1 \mathbf{M}_{i:k:l} + \boldsymbol{\gamma}_2 \mathbf{TG}_{jk:l}) + \varepsilon_{ij:k:l} \quad (1)$$

Here Yij:k:l is the outcome for person i observed at time j, nested within group k, which is in condition l; f(·) is a link function; and εij:k:l is an iid error or residual. Specifying both f(·) and the distribution of εij:k:l yields various models appropriate for a variety of outcomes; here we estimate linear models. The βs are fixed-effect parameters to be estimated and the γs are random-effect parameters (i.e., variance components) to be estimated. Cl is a dichotomous variable indicating membership in the STAR intervention condition, Tj is a dichotomous variable indicating the jth time point, TjCjl is the interaction between the study condition and time indicator variables. **Xij:k:l** is a vector of demographic and other potential confounds; none are included in this analysis because randomization created balance on potential confounds. **RANDk** is a vector of randomization factors (group-level variables used in the biased coin algorithm) and any blocking factors -- in this analysis, primary job function in the study group (i.e., core software development tasks vs. other) and size of study group. $\mathbf{G}_{k:l}$ is a vector of indicator variables for group membership, $\mathbf{M}_{i:k:l}$ is a vector of indicator variables for each

individual, and $\mathbf{TG}_{jk:l}$ is a vector of interactions between time points and group membership. Given the specification of the fixed effects, β3 captures the effect of the intervention at that follow-up time point (Murray 1998). The coefficient associated with the condition*time effect (here STAR*Wave 2) can be thought of as the difference-in-difference estimate.

We apply an intent-to-treat framework that provides a conservative estimate of the intervention effect. This means that we code all employees eligible for receiving the treatment as being in the STAR condition, even though individuals within the STAR-randomized study groups decided whether or not to participate in the STAR training sessions. Sessions were held during work hours and there was a mean attendance rate of 69 percent (for all employees and managers in STAR, including some who were not eligible for the study because they worked in other cities where data were not collected). In the analytic sample used here, 28 percent of employees attended half or fewer of the sessions and a small number of employees randomized to STAR (<3%) attended none of the sessions to which they were invited. As noted in Figure 1, 23 employees were excluded from the analysis. An intent-to-treat analysis must include those with a non-zero probability of receiving the treatment but 15 of the excluded employees were never invited to any STAR sessions, due to an error, so they had no chance of receiving the treatment. The remaining eight employees were not randomized because their team was reorganized under a manager who had previously been randomized to STAR, so management requested that they go through STAR.

FINDINGS

We first investigate whether STAR improves work resources and employees' experience of the work-family interface. In Table 2, the bold STAR*Wave 2 coefficient is the intervention (or treatment) effect of interest with a difference-in-difference interpretation. Other covariates include an indicator for randomization to the intervention condition, time point, and the randomization blocking variables (study group size and core job function) described above.

STAR increases employees' schedule control and supervisor support for family and personal life significantly, compared to changes in the control groups, providing an affirmative answer to our first research question. Table 3 presents standardized effect sizes calculated by dividing the STAR*Wave2 coefficient (from the models presented in Table 2) by the standard deviation of the outcome at baseline. We see a larger increase in schedule control (0.34) than supervisor support for family and personal life (0.13). The intervention effect for work-to-family conflict is marginally significant (p=.059) in these models and we also see a small, statistically significant intervention effect for family-to-work conflict. These models provide clear experimental evidence that employees in groups randomized to STAR saw larger decreases in work-to-family conflict and family-to-work conflict from baseline to six month follow-up than did those in usual practice control groups. STAR also significantly increases reported time adequacy with family members. Thus, in answer to our second question, all three measures of the work-family

interface improve more for the employees in STAR groups, though Table 3 reinforces that all three effect sizes are small.[5]

For our third research question, we turn to models investigating whether STAR had negative consequences by increasing work hours or psychological job demands. Employees might experience work intensification as an unintended byproduct of STAR increasing the permeability of work and nonwork domains across time and space; this would be the double-edged sword of workplace flexibility that scholars have noted (Blair-Loy 2009, Perlow 2012, Schieman et al. 2009). Table 4 shows there is no evidence that this occurred in this professional setting. The STAR*Wave 2 coefficients are not statistically significant in models of either work hours or psychological job demands (i.e., feeling rushed, overloaded by one's work). From the perspective of employers, another unintended but troubling effect of STAR might have been encouraging employees to work less, but these models do not point to any decreases in work hours. In sum, STAR had no significant effect on work hours or psychological job demands, in either direction.

Our fourth research question addressed whether there are different intervention effects by subgroups. Figures 2a-2f show the intervention effect (STAR*Wave 2 coefficient) for the unstratified model already reported above and then intervention effects for stratified models estimated separately for each subgroup. The unstratified intervention effect for the full study population is marked with a dotted horizontal line, with confidence intervals from subgroup models shown with bars. Appendix Table B reports intervention effects for subgroups with p-values and subgroup sample sizes.

We first investigate whether employees with greater apparent need of STAR see greater benefits from the intervention. We find that the effects of STAR on schedule control are of similar magnitude for employees with varying family demands (Figure 2a). Increases in schedule control almost across the board suggest that the intervention benefited employees with all types of family situations, and those with higher and lower schedule control at baseline. However, effects do differ according to baseline support from supervisors. The benefits of STAR for schedule control are especially evident for those who rated their supervisors as less supportive at baseline (intervention effect of 0.57, $p<.001$, as compared to .23 in the unstratified model; see Appendix B).[6] STAR effects are similar across baseline levels of schedule control and for employees working 50+ hours per week and those working fewer; this suggests that even those who had high schedule control and faced high demands at baseline felt that STAR gave them more choice over when, where, and how much they worked.

The effects of STAR on supervisor support for family and personal life do differ by family status as well as reported work conditions at baseline (Figure 2b and Appendix B). The effects of STAR on supervisor support for family and personal life are notably larger for fathers (.26) and sandwich generation employees (0.30) as compared to 0.13 in the unstratified model. Perhaps mothers, whose family responsibilities are often more visible and more normative, receive support from managers regardless of condition, while STAR encourages managers to demonstrate support for others' family responsibilities. Additionally, employees who reported low supervisor support, high

work-to-family conflict, or high family-to-work conflict at baseline saw especially large increases in their assessment of supervisor support for family and personal life with STAR. Among those experiencing high family-to-work conflict at baseline, the intervention effect was about five times larger (0.64, $p<.0001$) than in the unstratified model (0.13). Clearly, STAR helped employees whose family lives had conflicted with work at baseline feel more supported by their managers.

With regard to work-to-family conflict, there is some evidence that employees with more family demands benefit more from STAR (Figure 2c and Appendix B). in particular, sandwich generation employees (with at least one child at home and some adult care responsibilities) see the largest benefits of STAR with regard to work-to-family conflict; among these employees, the STAR intervention effect is -0.48 ($p=.01$), as compared to -0.12 for the unstratified model. STAR effects on work-to-family conflict are also larger for employees who had rated their supervisors as particularly unsupportive of family and personal needs at baseline (intervention effect of -0.36 for employees with low support for family as compared to -0.12 in the unstratified model) and those who reported high work-to-family conflict or high family-to-work conflict at baseline. Our qualitative research in this organization had revealed great variation across managers in their work styles, expectations regarding work time and remote work, and responsiveness to work-family concerns. The findings here suggest that STAR was particularly beneficial in improving the work-family interface for employees who previously felt their personal or family lives were less supported their supervisors. In models examining change in conflict from family to work, it was women who did not have children at home

(most of whom did have a spouse or partner) who saw greater effects of STAR (Figure 2d), though STAR mothers' mean family-to-work conflict declined nearly as much as did childless women's.

As seen in Figure 2e, STAR brings larger benefits with regard to time adequacy to parents with children at home (intervention effect of 0.23, p=.01 as compared to the unstratified effect of 0.12). Employees putting in *more* than 50 hours per week at baseline saw somewhat greater increases in time adequacy under STAR (intervention effects of 0.21, p=.05, as compared to 0.12 for the unstratified model), though the effects of STAR on work-to-family conflict and family-to-work conflict are non-significant among those these long hours (Figure 2c, 2d and Appendix B). Taken together, these findings suggest that STAR does bring some benefits to those working longer hours – by providing greater schedule control and supervisor support for family and personal life and helping employees feel they have more time with family – but does not override the effect of long work hours interfering with family and personal life. In sum, employees with greater family demands and particularly those who rated their supervisors as less supportive of family and personal life at baseline experienced greater impacts of STAR. A partial exception is the effect of STAR on schedule control, which is similar across family statuses with exceptionally large effects among those with initially low supervisor support for family and personal life.

The question remains, though, whether those who have fewer family responsibilities also benefit or perhaps feel pressured to take on more of a burden at work. To explore this, we consider the effects of STAR on work resources, the work-

family interface, and work intensification (hours and psychological job demands) for employees with no children or elder care responsibilities (labeled No Dependents in Appendix B and figures). Employees with no dependent care responsibilities experience the benefits of STAR with regard to schedule control but see smaller, non-significant effects for the other outcomes (supervisor support, work-to-family conflict, family-to-work conflict, and time adequacy). Recall that STAR has no significant effects on work hours or psychological job demands in the full sample (see Table 4), but perhaps STAR had these pernicious effects among employees who did not have children or other family members making claims on their time or energy. The effect of STAR on work hours is negative for parents of children under 18 (-1.14 indicating a decline of about 1 hour per week, p=.03) but not statistically significant (even at a marginal level) for those with no dependents. This suggests that STAR facilitates parents trimming their work time somewhat, in this salaried professional setting, but there is no clear evidence that others take on that work. There is also no evidence that psychological job demands increase for any subgroup; in fact, STAR reduces the job demands reported by men with no children at home (-.16, p=.06). We also investigated the effects of STAR specifically for singles with no children or adult care responsibilities (N=77, M=35 study groups) who might be expected to absorb additional work if talk of work-family backlash is correct. We find no significant effects of STAR on those employees' work hours or psychological job demands. These exploratory analyses suggest that STAR – which is deliberately available to all employees, regardless of family responsibilities – does not shift burdens from

parents or caregivers to others but it brings limited benefits to those with the fewest family responsibilities.

CONCLUSION

Using a randomized controlled design, this study provides the first experimental evidence that workplace interventions can reduce work-family conflict among employees and change the psychosocial environment at work, specifically increasing employees' control over the time and timing of their work and the support they receive from their supervisors for their family and personal lives. This group-randomized design significantly extends the body of mostly cross-sectional, observational research that has identified associations between schedule control, supervisor support for family life, and work-family conflict as well as the few quasi-experiments investigating workplace changes and work-family outcomes.

We find clear evidence of initial benefits for employees, with regard to improvements in schedule control, supervisor support for family and personal life, work-family conflict, and time adequacy. The reduction of work-family conflict for workers is critical, as this stressor has been related to numerous negative health and work outcomes for employees, their families, and the organizations in which they work (e.g., Allen et al. 2000, Crouter et al. 1999, Hammer and Zimmerman 2010, Kossek and Ozeki 1998). The findings regarding changes in work resources (schedule control and supervisor support for family and personal life) also point to the malleability of the work environment without major changes to work processes or job functions.

There are many existing studies of nationally representative samples of workers, and many of these examine the purported effects of certain work conditions or practices on employees. But group-randomized trials in workplaces such as the one reported here are rare, even though scholars are calling for greater rigor in order to make causal claims (Morgan and Winship 2007). We have drawn on just such a rigorous design to assess the impacts of an effort to change the norms and everyday practices in a work organization. By doing so, we demonstrate more conclusively that work-family conflicts are not simply private troubles of individual workers, but can be changed by changing the work environment.

This work also illustrates the feasibility of experimental, particularly group-randomized, designs to investigate and address the social environments that affect individuals and groups, while pointing the way to future research. Because the study design deliberately prioritizes strong causal claims and internal validity over generalizability to other organizations or workforces, additional research is needed to understand how organizational changes unfold in a variety of settings. Group-randomized studies are currently underway to is examine innovative work-family interventions in health care organizations, retail sites, and among public works workers – all settings with more low-wage workers and work processes that seem to require workers' presence on site – and to evaluate more traditional flexible work policies in a health care setting (Hammer 2012, Henly and Lambert 2012, Kossek 2012, Pitts-Catsouphes 2012). Other questions remain as well. Future analyses using these data (with longer follow-up periods) should investigate the persistence of these effects and whether these changes

contribute to improvements in employees' health and to the well-being of their partners and children. Research should also consider whether employees in STAR (or exposed to other work-family initiatives) and especially those who make more changes in their work practices suffer negative career consequences or whether the broad attempt to change expectations and norms in this organization avoid "flexibility stigma." Doing so will help establish whether new ways of working are fully institutionalized and legitimated in organizations that pursue broad organizational interventions such as this one or whether the ideal worker norm holds on, even in the face of a direct challenge.

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Notes

[1] We might also describe STAR as an effort to change specific aspects of the organizational culture, if organizational culture is defined broadly as the expectations, assumptions, interaction norms, practices, reward systems, and official employment policies that enforce all of this within a workplace (Kelly et al. 2010).

[2] Employees also worry about being marginalized or penalized if they utilize these arrangements and so they may avoid requesting or using the formal policies even when they are officially available (Glass 2004, Wharton et al. 2008). Employees who realize that "choosing" to engage in flexible work practices will likely have negative consequences for their career may not feel this is a real choice and so report limited schedule control as well.

[3] Participants were aware of the research evaluation of the STAR program, but experienced STAR as a pilot initiative rolled out by the company. The company provided executive sponsorship, practical support for the initiative (through staff time and space), and allowed participants to attend STAR sessions and complete related activities during the work day; the facilitators' fees were covered by research grants. Because this was a company pilot initiative, participants in STAR did not formally consent to participate but attended sessions like they attended other company meetings or trainings. Participation was high, with individuals attending on average 60 percent of the sessions they were invited to, but clearly not compulsory. Employees and managers who completed

interviews and health assessments for the study were, of course, formally consented and response rates are provided below.

[4] STAR was customized somewhat for the TOMO setting. For example, facilitators included examples gleaned from formative research in TOMO about the pressure for constant availability on the instant messaging (IM) system and the need to coordinate work across time zones, including coordinating work with contractors in India.

[5] Intervention effects are robust to the inclusion of a variable indicating whether the respondent's baseline survey was completed before or after the announcement of the upcoming merger and to models estimated at the work group (M=120) level that better reflects the day-to-day organization of this division.

[6] Larger intervention effects for a subgroup reflect both changes in the treated subgroups (ie, STAR employees with certain characteristics) and changes in the appropriate comparison subgroups. A larger intervention effect does not necessarily mean that the treated subgroup changed the most on the outcome, but that the gap in changes between treated and comparison subgroup was larger.

Table 1: Baseline Characteristics by Condition, at Individual Level

	STAR						Control						STAR - Control	
	N	Mean (1)	Median (2)	StdDev	Min	Max	N	Mean (3)	Median (4)	StdDev	Min	Max	Δ Mean (1) - (3)	Δ Median (2) - (4)
Work-Family Outcomes and Work Environment														
Schedule Control (1-5)	348	3.56	3.54	0.7	1.14	5	346	3.63	3.63	0.65	1.88	5	-0.07	-0.09
Supervisor Support for Family/Personal Life (1-5)	347	3.85	4	0.82	1	5	343	3.85	4	0.81	1	5	0	0
Work-to-Family Conflict (1-5)	348	3.1	3.2	0.95	1	5	346	3.05	3	0.94	1	5	0.05	0.2
Family-to-Work Conflict (1-5)	348	2.15	2	0.63	1	4.2	346	2.08	2	0.65	1	4.4	0.07	0
Time Adequacy Scale (1-5)	344	3.31	3.5	0.69	1	5	333	3.41	3.5	0.69	1.5	5	-0.1	0
Work Hours	348	45.36	45	5.57	5	70	346	45.43	45	5.75	30	70	-0.07	0
Work Hours >= 50	348	0.28	0	0.45	0	1	346	0.29	0	0.46	0	1	-0.01	0
Psychological Job Demands Scale (1-5)	348	3.62	3.67	0.7	1.67	5	346	3.54	3.67	0.71	1.67	5	0.08	0
Company Tenure (in years)	348	14.3	10	9.61	0	42	346	12.76	10	8.57	0	42	1.54	0
Decision Authority (1-5)	347	3.8	4	0.73	1	5	343	3.86	4	0.66	1	5	-0.06	0
Job Insecurity (1-4)	341	2.33	2	0.74	1	4	337	2.27	2	0.74	1	4	0.06	0
Baseline Survey after Merger Announcement	348	0.46	0	0.5	0	1	346	0.46	0	0.5	0	1	0	0
Demographics and Family Demands														
Age	348	46.17	46.5	9.15	25	70	345	45.88	46	8.67	24	70	0.29	0.5
Female	348	0.4	0	0.49	0	1	346	0.37	0	0.48	0	1	0.03	0
Race														
White, non-Hispanic	348	0.69	1	0.46	0	1	346	0.69	1	0.46	0	1	0	0
Asian Indian	348	0.13	0	0.34	0	1	346	0.17	0	0.37	0	1	-0.04	0
Other Asian and Other Pacific Islander	348	0.06	0	0.24	0	1	346	0.05	0	0.23	0	1	0.01	0
Hispanic	348	0.07	0	0.26	0	1	346	0.05	0	0.23	0	1	0.02	0
Black, Other, and More than one race	348	0.05	0	0.21	0	1	346	0.03	0	0.18	0	1	0.02	0
Married/Partnered	348	0.81	1	0.39	0	1	346	0.8	1	0.4	0	1	0.01	0
No children at home	348	0.53	1	0.5	0	1	346	0.53	1	0.5	0	1	0	0
Fathers	348	0.27	0	0.44	0	1	346	0.32	0	0.47	0	1	-0.05	0
Mothers	348	0.2	0	0.4	0	1	346	0.15	0	0.36	0	1	0.05	0
Number of children living in respondent's home for 4 or more days/week	348	0.78	0	0.97	0	5	346	0.81	0	1.05	0	8	-0.03	0
Child with disability or chronic illness	199	0.12	0	0.32	0	1	192	0.09	0	0.29	0	1	0.03	0
Single Parents	348	0.05	0	0.21	0	1	346	0.03	0	0.18	0	1	0.02	0
Respondent does care for adult relative	348	0.23	0	0.42	0	1	346	0.23	0	0.42	0	1	0	0

Note 1: The unit of analysis for these results is person-wave. Employees are restricted to those (1) who completed both wave 1 and wave 2 CAPI, (2) excluding 15 employees in work groups 56b, 56b.1, 56b.2, and 56b.3, and (3) excluding 8 employees in work group 14a.3 for whom we do not have randomization-related variables. N = 694.

Note 2: For these scales (except the 2-item time adequacy with family and low-value work), mean is imputed from other responses by the same respondent to other questions in the scale and it is only imputed if the respondent answered 75% or more of the questions in the scale.

Table 2: Repeated Measures Analysis for Work-Family Outcomes: Study Group Level

	Schedule Control (M = 56 study groups, N = 1388 person-waves)				
	Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	-0.092	0.079	52	-1.17	0.247
Wave 2	0.035	0.029	54	1.20	0.235
STAR*Wave 2	0.231	0.041	54	5.63	<.0001
#Employees for Randomizatic	0.005	0.003	52	1.45	0.152
Core Function (see Note 3)	0.006	0.076	52	0.08	0.939
Intercept	3.505	0.096	52	36.60	<.0001
	Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.316	0.046		
CS	ID(studygroup*star)	1.782	0.261		
Residual		1	0.146		
-2 Res Log Likelihood	AIC	AICC	BIC		
2403.8	2409.8	2409.9	2415.9		

	Supervisor Support for Family/Personal Life (M = 56 study groups, N = 1379 person-waves)				
	Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	-0.010	0.087	52	-0.12	0.908
Wave 2	-0.063	0.037	54	-1.71	0.094
STAR*Wave 2	0.131	0.052	54	2.51	0.015
#Employees for Randomizatior	-0.001	0.003	52	-0.21	0.834
Core Function	-0.094	0.083	52	-1.13	0.264
Intercept	3.923	0.105	52	37.51	<.0001
	Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.205	0.047		
CS	ID(studygroup*star)	1.555	0.361		
Residual		1	0.232		
-2 Res Log Likelihood	AIC	AICC	BIC		
2940.5	2946.5	2946.5	2952.5		

	Work-to-Family Conflict (M = 56 study groups, N = 1388 person-waves)				
	Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	0.106	0.117	52	0.91	0.366
Wave 2	-0.103	0.043	54	-2.42	0.019
STAR*Wave 2	-0.116	0.060	54	-1.93	0.059
#Employees for Randomizatic	-0.006	0.005	52	-1.22	0.226
Core Function	-0.024	0.114	52	-0.21	0.834
Intercept	3.181	0.142	52	22.44	<.0001
	Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.360	0.113		
CS	ID(studygroup*star)	1.423	0.447		
Residual		1	0.314		
-2 Res Log Likelihood	AIC	AICC	BIC		
3350.8	3356.8	3356.9	3362.9		

	Family-to-Work Conflict (M = 56 study groups, N = 1388 person-waves)				
	Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	0.088	0.060	52	1.47	0.147
Wave 2	0.030	0.030	54	1.00	0.320
STAR*Wave 2	-0.088	0.043	54	-2.05	0.045
#Employees for Randomizatior	0.001	0.002	52	0.31	0.756
Core Function	0.117	0.055	52	2.11	0.040
Intercept	1.999	0.071	52	28.20	<.0001
	Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.094	0.015		
CS	ID(studygroup*star)	1.338	0.214		
Residual		1	0.160		
-2 Res Log Likelihood	AIC	AICC	BIC		
2349.3	2355.3	2355.3	2361.4		

	Time Adequacy with Family (M = 56 study groups, N = 1360 person-waves)				
	Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	-0.098	0.066	52	-1.48	0.146
Wave 2	-0.030	0.039	54	-0.77	0.445
STAR*Wave 2	0.118	0.054	54	2.16	0.035
#Employees for Randomizatic	0.001	0.002	52	0.62	0.541
Core Function	0.005	0.060	52	0.08	0.935
Intercept	3.358	0.078	52	43.08	<.0001
	Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.073	0.018		
CS	ID(studygroup*star)	0.856	0.213		
Residual		1	0.249		
-2 Res Log Likelihood	AIC	AICC	BIC		
2702.9	2708.9	2708.9	2714.9		

Table 3: Treatment Effect Size: Study Group Level			
Outcomes:	Estimate	Effect Size	Pr > |t|
Schedule Control	0.231	0.342	<.0001
Supervisor Support for Family/Personal Li	0.131	0.160	0.015
Work-to-Family Conflict	-0.116	0.122	0.059
Family-to-Work Conflict	-0.088	0.138	0.045
Time Adequacy with Family	0.118	0.171	0.035
Work Hours	-0.263	0.047	0.482
Psychological Job Demands	-0.075	0.107	0.106

standard deviation of the outcome at baseline. Same analytic sample and scales as Tables 2 and 4.

Table 4: Repeated Measures Analysis for Work Intensification Outcomes: Study Group Level

	Work Hours (M = 56 study groups, N = 1388 person-waves)						**Psychological Job Demands (M = 56 study groups, N = 1388 person-waves)**				
	Estimate	Std. Error	DF	t Value	Pr > |t|		Estimate	Std. Error	DF	t Value	Pr > |t|
STAR	-0.106	0.651	52	-0.16	0.871	STAR	0.079	0.085	52	0.93	0.355
Wave 2	-0.197	0.263	54	-0.75	0.458	Wave 2	-0.050	0.033	54	-1.54	0.129
STAR*Wave 2	-0.263	0.372	54	-0.71	0.482	**STAR*Wave 2**	-0.075	0.046	54	-1.64	0.106
#Employees for Randomizati	-0.006	0.026	52	-0.22	0.829	#Employees for Randomizati	-0.001	0.003	52	-0.35	0.728
Core Function (see Note 3)	-0.924	0.627	52	-1.47	0.147	Core Function	-0.105	0.082	52	-1.28	0.208
Intercept	45.976	0.788	52	58.37	<.0001	Intercept	3.615	0.103	52	35.12	<.0001
	Subject	Ratio	Estimate				Subject	Ratio	Estimate		
Intercept	studygroup(star)	0.258	3.087			Intercept	studygroup(star)	0.309	0.057		
CS	ID(studygroup*star	1.403	16.791			CS	ID(studygroup*star	1.418	0.259		
Residual		1	11.972			Residual		1	0.183		
-2 Res Log Likelihood	AIC	AICC	BIC			-2 Res Log Likelihood	AIC	AICC	BIC		
8364.3	8370.3	8370.3	8376.4			2595.2	2601.2	2601.2	2607.3		

Note 1: Employees are restricted to those (1) who completed both wave 1 and wave 2 CAPI, (2) excluding 15 employees in work groups 56b, 56b.1, 56b.2, and 56b.3, and (3) excluding 8 employees in work group 14a.3 for whom we do not have randomization-related variables.

Note 2: For psychological job demands scale, mean is imputed from other responses by the same respondent to other questions in the scale and it is only imputed if the respondent answered 75% or more of the questions in the scale.

Note 3: The core function identifies groups where most individuals were involved in software development with groups dominated by other IT job functions as reference group.

Appendix Table A: Description of Scales

Scale	Source	Cronbach's Alpha (W1)	Cronbach's Alpha (W2)	Range
Schedule Control	Thomas & Ganster 1995	0.802	0.825	1-5
Supervisor Support for Family/Personal Life	Hammer et al. 2009	0.874	0.876	1-5
Work-to-Family Conflict	Netemeyer et al. 1996	0.915	0.914	1-5
Family-to-Work Conflict	Netemeyer et al. 1996	0.835	0.863	1-5
Time Adequacy with Family	Dunst & Leet 1987	0.358	0.293	1-5
Psychological Job Demands	Karasek et al. 1998	0.575	0.581	1-5

Note 1: Employees are restricted to those (1) who completed both wave 1 and wave 2 CAPI, (2) excluding 15 employees in work groups 56b, 56b.1, 56b.2, and 56b.3, and (3) excluding 8 employees in work group 14a.3 for whom we do not have randomization-related variables.

Note 2: Time adequacy with family is a two-item scale the correlation coefficient is reported here.

Appendix Table B: Summary of Intervention Effects for Different Subgroups

	Work-Family Outcomes															Work Intensification Outcomes					
	Schedule Control			Supervisor Support for Family/Personal Life			Work-to-Family Conflict			Family-to-Work Conflict			Time Adequacy with Family			Work Hours			Job Demands		
Stratified by:	Estimate	DF	*P*-value	Estimate	DF	*P*-value	Estimate	DF	*P*-value	Estimate	DF	*P*-value	Estimate	DF	*P*-value	Estimate	DF	*P*-value	Estimate	DF	*P*-value
UNSTRATIFIED ESTIMATE	0.231	54	<.0001	0.131	54	0.015	-0.116	54	0.059	-0.088	54	0.045	0.118	54	0.035	-0.263	54	0.482	-0.075	54	0.106
Parents with Child at Home																					
Women (N = 121)	0.273	38	0.022	0.078	38	0.495	-0.201	38	0.233	-0.167	38	0.163	0.202	38	0.108	-1.459	38	0.155	-0.085	38	0.418
Men (N= 205)	0.181	53	0.012	0.261	52	0.009	-0.189	53	0.055	-0.071	53	0.401	0.151	51	0.152	-1.070	53	0.066	-0.032	53	0.710
No Child (or none at home)																					
Women (N = 146)	0.239	41	0.019	0.061	41	0.607	-0.141	41	0.350	-0.190	41	0.031	0.125	40	0.308	0.550	41	0.591	-0.008	41	0.938
Men (N= 222)	0.231	50	0.001	0.089	50	0.352	0.038	50	0.702	0.039	50	0.567	0.039	50	0.687	0.654	50	0.260	-0.163	50	0.063
Child at Home Only (N = 261)	0.250	54	<.001	0.167	54	0.048	-0.137	54	0.162	-0.132	54	0.083	0.230	52	0.012	-1.142	54	0.026	-0.013	54	0.859
Care for Adults Only (N = 95)	0.205	42	0.064	0.205	42	0.183	-0.257	42	0.172	-0.011	42	0.923	0.124	42	0.308	1.362	42	0.363	-0.137	42	0.364
Child at Home and Care for Adults (N = 65)	0.125	36	0.388	0.295	36	0.073	-0.482	36	0.011	-0.112	36	0.514	-0.065	36	0.708	-1.510	36	0.358	-0.178	36	0.203
No Dependents (N = 273)	0.250	54	<.001	0.032	54	0.707	0.048	54	0.613	-0.065	54	0.284	0.055	53	0.557	0.310	54	0.536	-0.087	54	0.218
Low Schedule Control (< 3) (N = 122)	0.217	41	0.050	-0.010	41	0.948	-0.009	41	0.947	-0.089	41	0.390	0.021	41	0.881	-0.354	41	0.710	0.024	41	0.852
High Schedule Control (>=3) (N = 572)	0.200	54	<.0001	0.142	54	0.011	-0.128	54	0.064	-0.082	54	0.091	0.131	54	0.032	-0.226	54	0.579	-0.092	54	0.067
Low Supervisor Support for Family/Personal Life (< 3) (N = 84)	0.575	35	0.001	0.356	35	0.084	-0.358	35	0.079	-0.126	35	0.244	0.062	35	0.704	1.730	35	0.319	-0.169	35	0.306
High Supervisor Support for Family/Personal Life (>=3) (N = 606)	0.175	54	<.0001	0.084	54	0.089	-0.073	54	0.248	-0.084	54	0.079	0.123	54	0.038	-0.542	54	0.129	-0.051	54	0.269
Work Hours >= 50 (N = 200)	0.262	47	0.002	0.198	47	0.069	-0.075	47	0.538	-0.075	47	0.353	0.210	47	0.052	0.859	47	0.213	-0.099	47	0.264
Work Hours < 50 (N = 494)	0.219	54	<.0001	0.104	54	0.084	-0.134	54	0.058	-0.093	54	0.073	0.082	54	0.201	-0.750	54	0.077	-0.066	54	0.226
High Work-to-Family Conflict (>=4) (N = 147)	0.281	46	0.007	0.265	46	0.057	-0.179	46	0.206	-0.160	46	0.123	0.140	46	0.184	0.664	46	0.484	-0.081	46	0.467
Low Work-to-Family Conflict (< 4) (N = 547)	0.217	54	<.0001	0.092	54	0.098	-0.088	54	0.157	-0.068	54	0.155	0.114	54	0.076	-0.486	54	0.222	-0.071	54	0.158
High Family-to-Work Conflict (> 2.8) (N = 120)	0.304	40	0.005	0.640	40	<.0001	-0.277	40	0.122	-0.112	40	0.347	0.422	39	0.002	-0.116	40	0.913	-0.184	40	0.158
Low Family-to-Work Conflict (<= 2.8) (N =	0.216	54	<.0001	0.022	54	0.695	-0.078	54	0.220	-0.068	54	0.106	0.052	54	0.389	-0.305	54	0.440	-0.050	54	0.306

Note 1: Employees are restricted to those (1) who completed both wave 1 and wave 2 CAPI, (2) excluding 15 employees in work groups 56b, 56b.1, 56b.2, and 56b.3, and (3) excluding 8 employees in work group 14a.3 for whom we do not have randomization-related variables.

Note 2: These estimates come from repeated measures analysis conducted for different subgroups and have adjusted for randomization variables (i.e., number of employees for randomization and study group functions). The coefficients reported here are treatment by time indicator interaction.

Note 3: For these scales (except the 2-item time adequacy with family), mean is imputed from other responses by the same respondent to other questions in the scale and it is only imputed if the respondent answered 75% or more of the questions in the scale.

Figure 1. Study Design and Response Rates

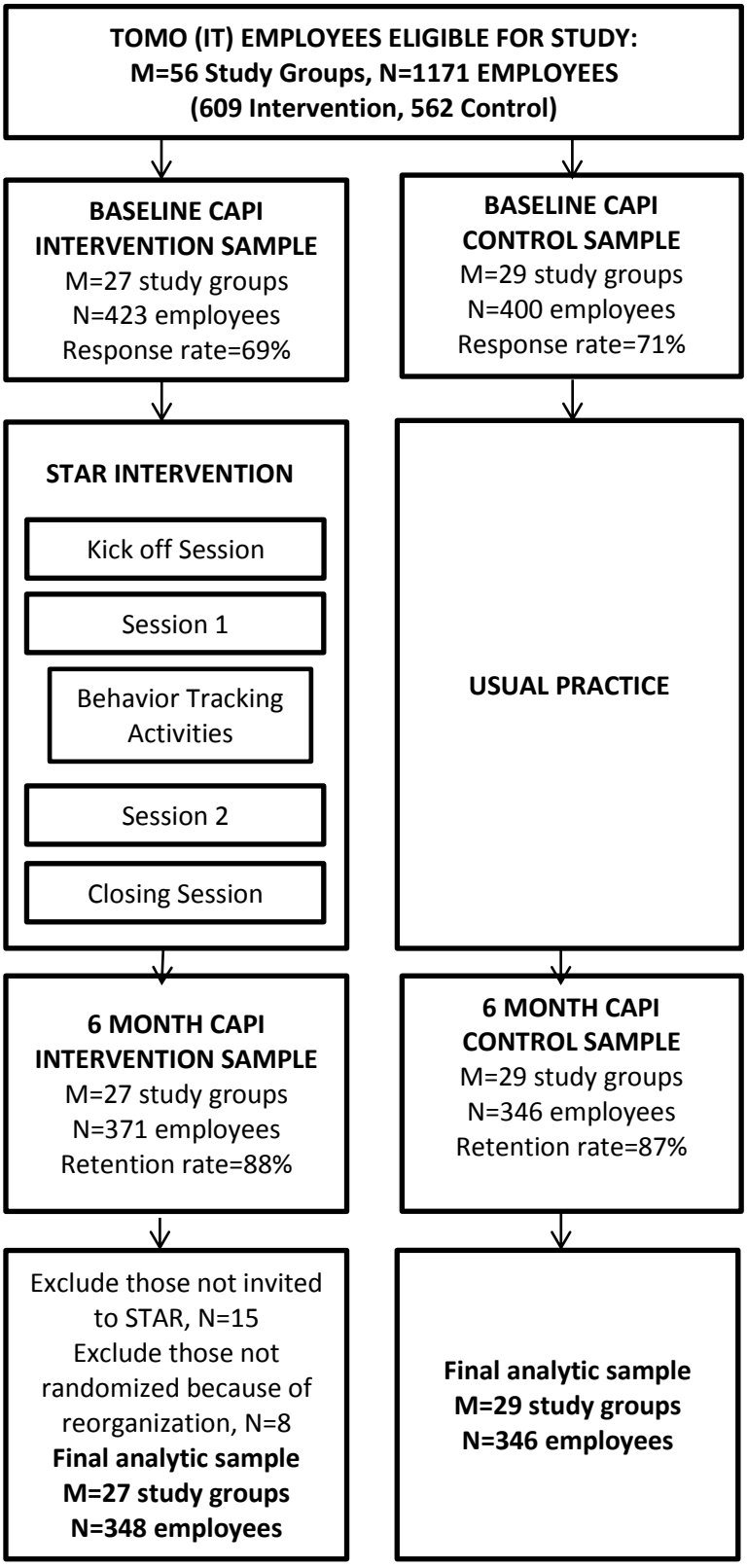

Figure 2a. Intervention Effects for Schedule Control by Subgroups

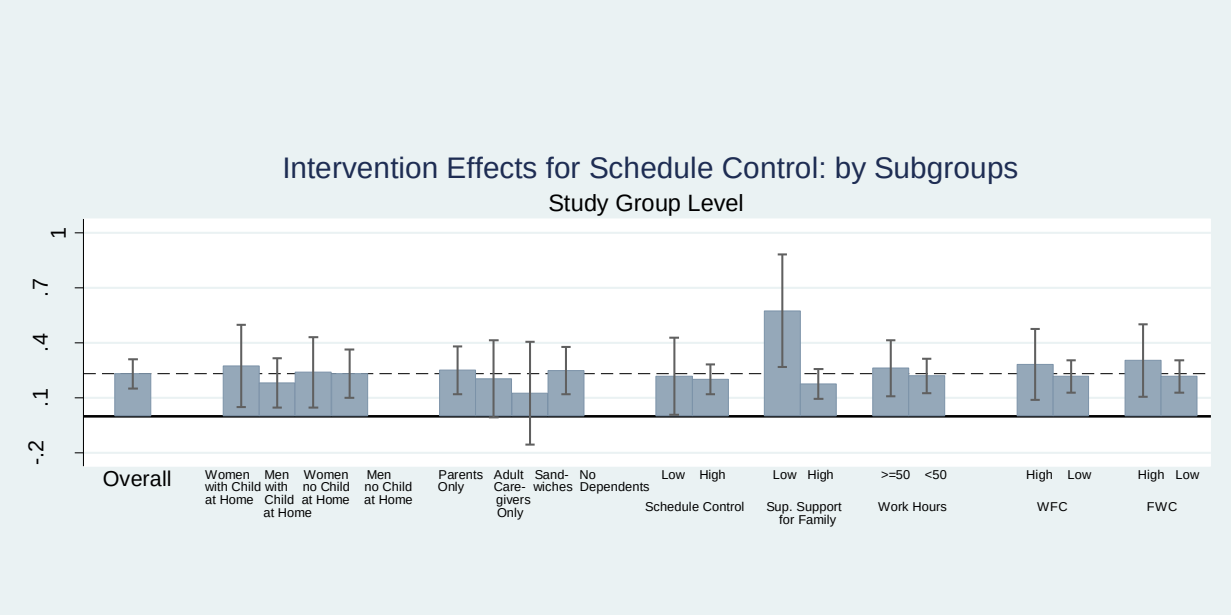

Figure 2b. Intervention Effects for Supervisor Support for Family by Subgroups

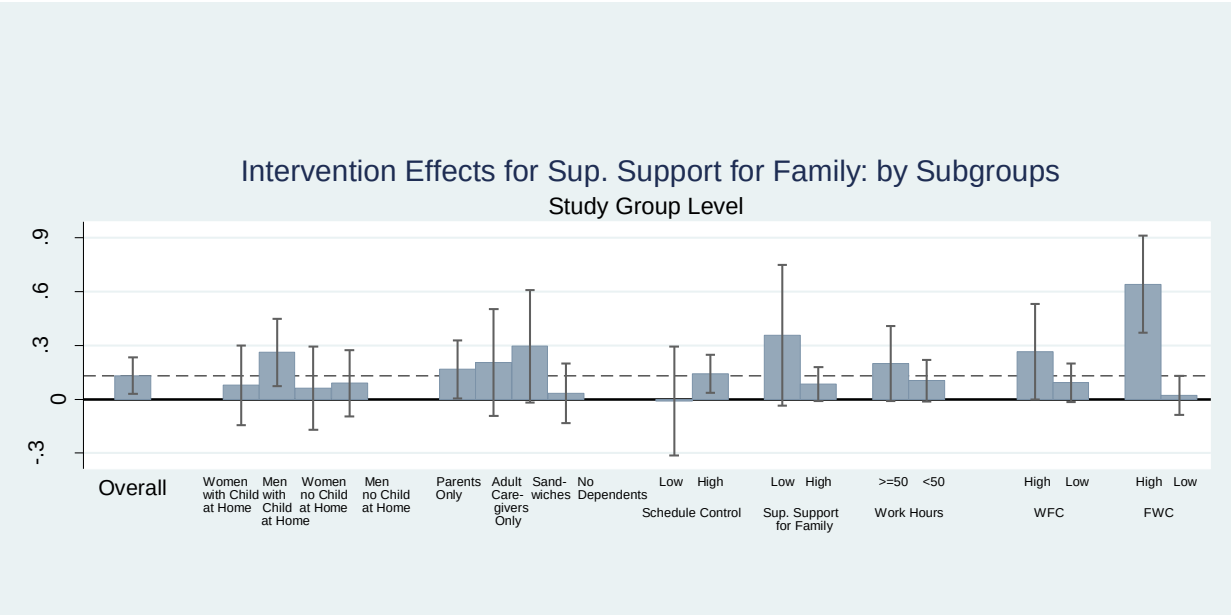

Figure 2c. Intervention Effects for Work-to-Family Conflict by Subgroups

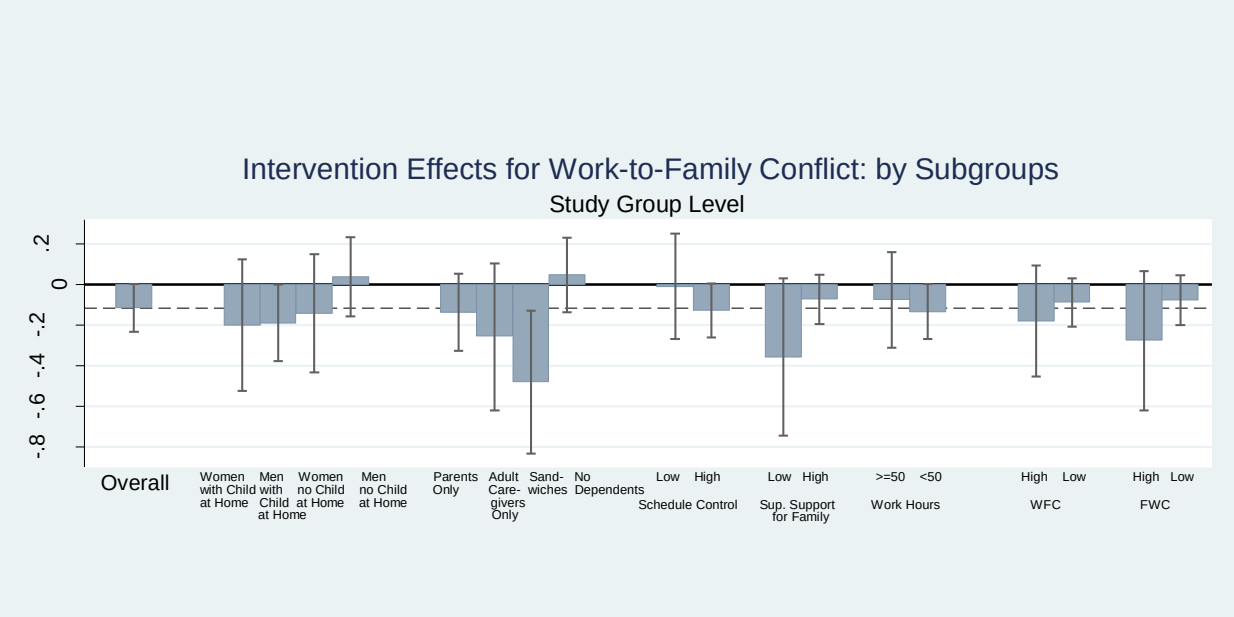

Figure 2d. Intervention Effects for Family-to-Work Conflict by Subgroups

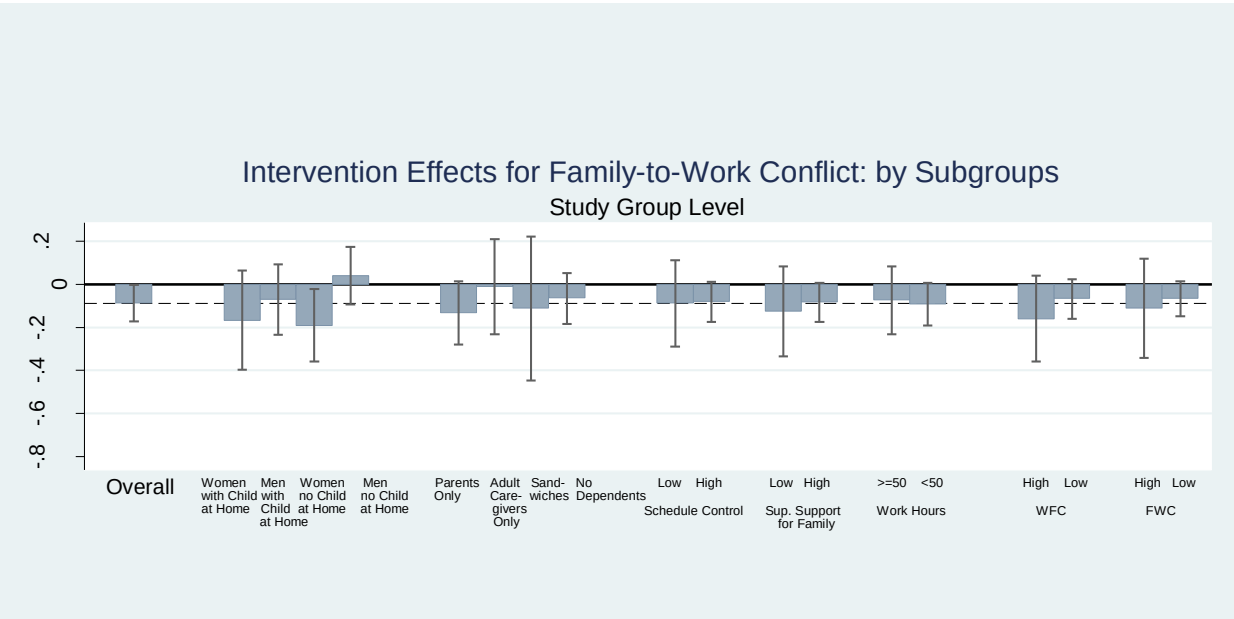

Figure 2e. Intervention Effects for Time Adequacy by Subgroups

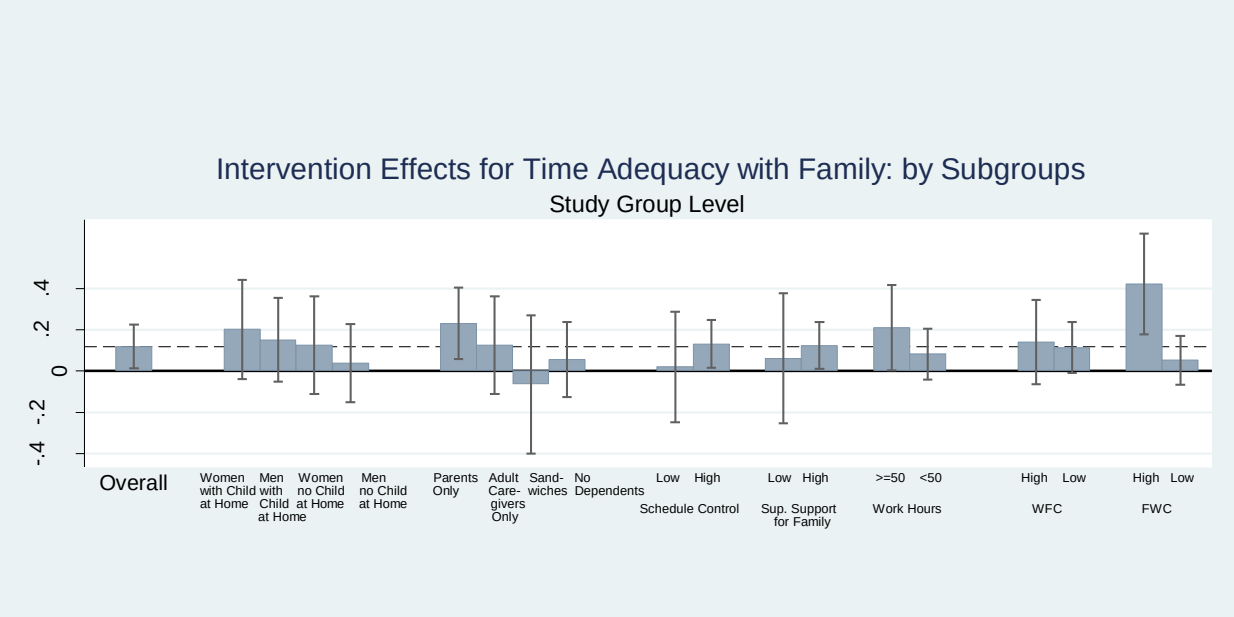

Figure 2f. Intervention Effects for Work Hours by Subgroups

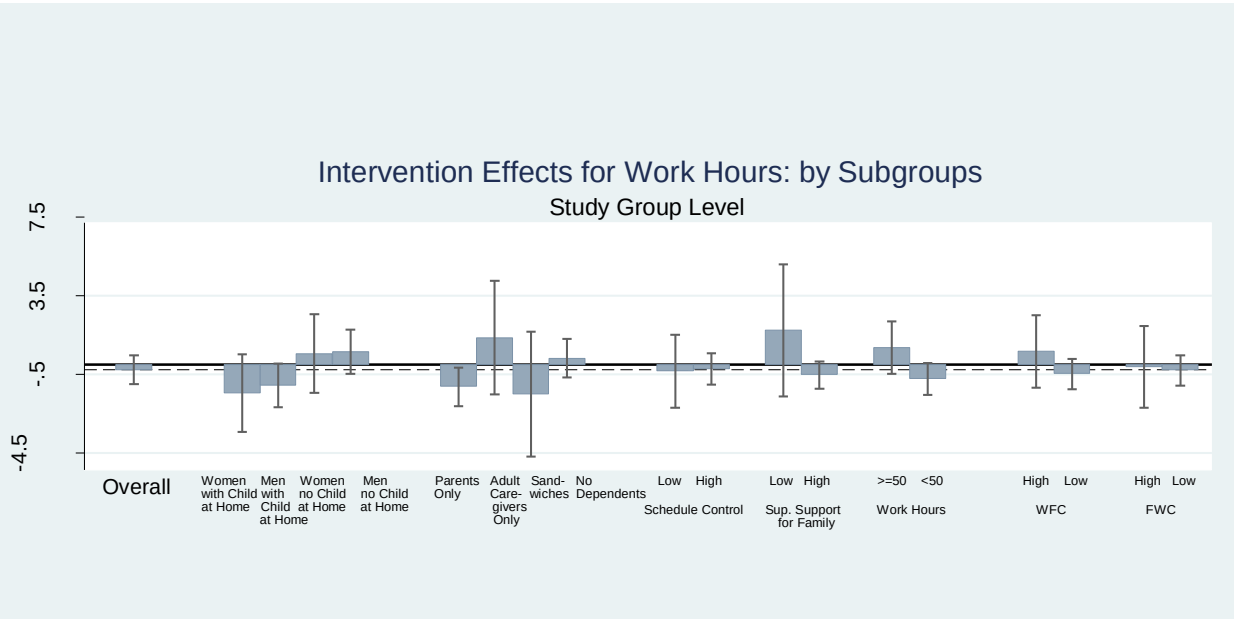

Figure 2g. Intervention Effects for Psychological Job Demands by Subgroups