Leading by Doing: How Female Supervisors Motivate Workers through Subordinate Scut Work

Aruna Ranganathan
Stanford University

Ranjitha Shivaram
MIT

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Abstract

Using ethnographic, personnel, and field experimental data from an Indian garment factory, this paper investigates whether manager gender affects worker productivity and if so, how. We argue that female managers can motivate greater worker productivity than male managers by performing what we call subordinate scut work – routine tasks of their subordinates – which increases subordinates’ engagement with their work. We posit that female managers are more likely to do subordinate scut work in female-typed workplaces and are more effective than male managers when they do, given the female-typing of their subordinates’ tasks. Our qualitative data help to generate hypotheses that we test using (a) personnel data on individual worker productivity, where workers experience quasi-random switches between male and female supervisors, and (b) a lab-in-the-field experiment, where we experimentally manipulate supervisors’ ability to perform subordinate scut work. We further demonstrate that despite female supervisors’ greater effectiveness, they earn significantly less than their male counterparts. This paper contributes to the industrial sociology literature on motivating worker productivity by drawing attention to the important role of manager gender and by studying a female-typed workplace. The paper also contributes to the sociological literature on gender and leadership by investigating objective worker productivity and uncovering subordinate scut work as a novel managerial practice that fosters engagement with work and improves worker productivity, but perhaps helps sustain the devaluation of women in management.
How managers motivate workers to be productive is one of organizational and industrial sociology’s oldest and most central problems (for a review, see Barley and Kunda 1992; Scott 2004). Early scholars in the field investigated the use of time and motion studies in factories to finely monitor worker productivity (Gilbreth 1911; Taylor 1914); later, scholars examined the ways in which organizations made workers more productive by promoting employee welfare and working conditions (Mayo 1933; Hertzberg 1966). More recently, researchers have investigated how managers improve worker productivity and create high-performance work systems through the engineering of incentives (Bandiera, Barankay and Rasul 2005, 2013), implementation of enabling technologies (Adler and Borys 1996), and the design of jobs (Perlow 1998; Bernstein 2012).

However, this industrial sociology literature on worker productivity has paid scant attention to the role that manager gender plays in affecting productivity, perhaps because the workplaces studied in the literature have historically had little gender variation. But the world of work is changing (Osterman et al. 2002): women have been growing in representation in managerial positions around the world, especially in what are described as female-typed workplaces, in which women dominate front-line positions and perform what is considered to be women’s work (Nieva and Gutek 1981; Jacobs 1992). Therefore, in this paper, we use a female-typed workplace to investigate how manager gender affects worker productivity. This is a question of paramount importance because the trend of promoting women into management positions depends crucially on how well they can motivate workers and thereby contribute to organizational performance.

In fact, a parallel literature on gender and leadership has extensively compared male and female leaders’ effectiveness in their roles (Rudman and Glick 1999; Ridgeway 2000; Carly and
Eagly 2001). This literature has demonstrated that whether male or female leaders are more effective depends on contextual factors, such as the gender-typing of the workplace (Eagly, Karau and Makhijani 1995). However, this literature has predominantly looked at the perceived effectiveness of male and female leaders rather than actual effectiveness, perhaps because subjective evaluations become salient absent objective data on worker performance (Eagly 2013). Further, to explain the differences in perceived effectiveness of male and female leaders, the literature has argued that leadership style varies by gender, with female leaders being more likely to adopt styles that are participative and transformational (Eagly and Johnson 1990; Eagly, Johannesen-Schmidt and van Engen 2003). However, recent scholarship has argued that leadership style is in fact a multi-dimensional construct and has advocated for identifying and studying the specific managerial practices that make up different styles (van Knippenberg and Sitkin 2013). Therefore, we investigate whether manager gender affects objective worker productivity in a female-typed workplace and what managerial practices underlie this effect.

In this paper, we argue, first, that female managers motivate greater worker productivity than male managers in female-typed workplaces. Second, building on the concept of scut work, used in the professions literature to refer to “menial work in the service of the client” (Hughes 1958; Abbott 1988; Huising 2014: 289), we argue that female managers motivate greater worker productivity than male managers by performing subordinate scut work, which we define as routine tasks of their subordinates. This practice, we argue, has the effect of improving subordinates’ engagement with their work, thereby improving productivity. We posit that female managers are more likely to perform subordinate scut work in female-typed workplaces than male managers and are more effective when they do because the routine work being performed by subordinates is considered to be women’s work. We finally demonstrate that even though female
supervisors motivate greater worker productivity than male supervisors through subordinate scut work, they earn significantly less than their male counterparts.

Our setting for this study is a large garment factory in India. Garment factories have long been considered prototypical female-typed workplaces (Balkwell and Berger 1986). The factory we study has a female-dominated front-line workforce but employs both men and women as supervisors, thus offering important demographic variation among managers in the same role performing exactly the same job, which allows us to test whether manager gender affects worker productivity. Additionally, real-time individual worker productivity is captured by the factory in one garment line using radio frequency identification (RFID) tags that are attached to every garment produced, offering a rare objective measure of worker productivity.

We adopt a full-cycle research design for this study (Fine and Elsbach 2000; Chatman and Flynn 2005). We first conducted eighteen months of ethnographic fieldwork during which time we also conducted interviews with workers and supervisors at this factory, which produced three hypotheses about manager gender, scut work, and worker productivity. To test the hypotheses, we drew on personnel data on individual productivity using a sample of female workers over a two-year period, exploiting quasi-random changes in supervisor gender for these workers. We then conducted a lab-in-the-field experiment (Baldassari 2015), in which we manipulated supervisors’ ability to perform subordinate scut work in experimental sessions. Each session consisted of five randomly-selected workers who performed a uniform task under either a male or female supervisor, allowing us to measure their productivity as well as engagement with their work through video recordings of the sessions. We finally obtained wage data for a sample of supervisors.
This paper contributes to the literature on worker productivity by highlighting the important role that manager gender plays in motivating employees and by studying a female-typed workplace, discovering that female supervisors outperform their male counterparts in this context. The paper also contributes to the literature on gender and leadership with the finding that subordinate scut work is a novel managerial practice that cultivates engagement with work and improves worker productivity but perhaps helps sustain the devaluation of women in management. The paper further breaks ground in this literature by studying objective worker productivity rather than relying on subjective reports of effectiveness.

In what follows, we review the industrial sociology and gender literatures. We then present the qualitative data that we use to develop our three main hypotheses. Next, we describe how we test these hypotheses with personnel records and experimental data, and we conclude by discussing the implications of this research for theory and practice.

**MOTIVATING WORKER PRODUCTIVITY: THE ROLE OF MANAGER-GENDER**

Motivating worker productivity is one of industrial organizations’ central tasks (Bendix 1956; Jacoby 1991). Scholars have been theorizing about how managers can and should motivate their employees ever since the time of the Industrial Revolution (Owen 1813), giving rise over time to a series of managerial ideologies including welfare capitalism (Montgomery 1832), scientific management (Taylor 1914), and the human relations movement (Mayo 1933). On the one hand were rational theories of management that advocated streamlining production processes and appealing to workers’ self-interest in order to motivate them; on the other were normative theories emerging especially from the field of industrial relations suggesting that managers could more effectively motivate workers by attending not just to their behaviors but to their thoughts and emotions as well (Barley and Kunda 1992).
More recently, scholars have empirically investigated a variety of human resource levers that managers can use to motivate worker productivity and create high-performance work systems (Huselid 1995; MacDuffie 1995; Ichniowski et al. 1997; Appelbaum 2000). For example, some scholars have investigated how different incentive schemes affect worker productivity (Wagner, Rubin and Callahan 1988; Wright et al. 1993; Pfeffer and Langton 1993). This research suggests that individual piece rates are more effective in increasing productivity than relative incentive schemes (Bandiera, Barankay and Rasul 2005) and that monetary prize tournaments increase the productivity only of workers at the top (Bandiera, Barankay and Rasul 2013). Other research has investigated the role of technology in facilitating worker productivity (Brynjolfsson and McAfee 2014). Some work in this domain suggests that when technology allows employees to better master their tasks (Adler and Borys 1989) or even gamify their work (Mollick and Rothbard 2014), it can lead to increased productivity. A third line of research into organizational and job design (Hackman and Oldham 1976; Cohen 2012) has uncovered that transparent organizational design and clear boundaries between work and family life could result in more productive workers (Perlow 1998; Bernstein 2012).

While the industrial sociology literature on levers that promote worker productivity is diverse, the influence of managers themselves is understudied. For example, one recent article remarks, “The literature has been largely silent on the effects that bosses actually have on affecting worker productivity” (Lazear et al. 2015: 824). In particular, one specific characteristic of bosses that remains unexplored is that of manager gender. This is perhaps because the workplaces studied in the productivity literature historically had little gender variation, and managerial positions in particular were once reserved for men (Kanter 1977). In the past 50 years, however, the population of managers has become significantly more diverse: women have been making inroads into these
historically male roles both in the Western world and in developing economies (Cappelli 1999; Osterman et al. 2002). While there is growing gender diversity among managers, we know little about the effects of this manager gender diversity on worker productivity. Further, it is reasonable to expect that female managers might motivate workers differently than their male colleagues owing to gender status dynamics that have been documented consistently across many cultures (Williams and Best 1990; Jacobs 1992; Glick et al 2000, 2004). Therefore, in this paper, we investigate whether manager gender affects worker productivity and if so, how.

We investigate this question in the context of a female-typed workplace, defined as a work setting numerically dominated by or associated with women (Nieva and Gutek 1981; Ragins 1989), such as a primary education or nursing facility (Reskin 1993; Ridgeway 2011). Our existing theories of management come predominantly from studying male workers in male-typed workplaces (Acker 1990) and gender-neutral workplaces (Doering and Thebaud 2017), but what works to motivate male workers might not work to motivate female workers (Klein and Hodges 2001). Therefore, we break from previous research by investigating the impact of manager gender on worker productivity in a female-typed work context that helps advance our existing theories.

The findings of this research have real-world consequences for employment opportunities for women. The trend of promoting women into managerial roles is likely to depend on how effectively they contribute to organizational performance (Smith et al. 2006; Dezso and Ross 2012) and worker productivity is perhaps one of the most important indicators of organizational performance. Indeed, holding a management position in itself can bring income, status, and empowerment to female managers, especially in developing economies (Joshi et al 2015). While the industrial sociology literature on motivating worker productivity has little to say about whether
female managers will be more or less effective than male managers in motivating workers in a female-typed workplace, the literature on gender and leadership offers a way forward.

**Gender and Leadership**

The sociological literature on gender and leadership has extensively compared male and female leaders’ effectiveness in their roles, though the focus has been on how their effectiveness is perceived by those they lead rather than their effect on objective worker productivity (Carly and Eagly 2001; Ridgeway 2000; Rudman and Glick 1999, 2001, 2012). This literature has argued that gender roles and gender status beliefs spill over into the organizational domain and thereby affect leader effectiveness (Ridgeway 2001; Eagly and Karau 2002; Ely and Padavic 2007). In particular, this literature has demonstrated that male and female leaders are perceived to be differentially effective at managing and motivating worker productivity in different settings and in different leadership roles (Fiedler and Chemers 1984; Eagly, Karau and Makhijani 1995).

With respect to female-typed workplaces, some scholars have argued that male leaders are seen as being more effective: they encounter a “glass escalator,” a phenomenon in which female workers bestow the few men in the workplace with authority and control (Williams 1992, 1995; Maume 1999; Kmec 2008; Wingfield 2009). On the other hand, others have demonstrated that when the workplace is female-typed, women leaders are seen as more effective than their male counterparts because the leadership role is defined in feminine terms (Pugh and Wahrman 1983, Eagly, Karau and Makhijani 1995; Fletcher 2001; Paustian-Underdahl et al. 2014; Chan and Anteby 2016). Thus, the literature has produced mixed evidence as to whether male or female leaders will be more effective at motivating workers in female-typed workplaces.

Further, the literature has predominantly investigated perceived effectiveness of male and female leaders rather than their actual effectiveness (Eagly 2013; for an exception see Szilagyi
1980). In particular, the existing literature has focused on subjective measures, such as ratings of leaders’ performance by colleagues or subordinates, rather than objective measures of performance (Eagly, Karau and Makhijani 1995; Eagly and Johannesen-Schmidt 2001). While subjective evaluations are important, especially in the absence of objective metrics, they could reflect raters’ gender bias rather than genuine differences in effectiveness (Eagly 2013). In fact, in their highly influential meta-analysis of gender and leader effectiveness, Eagly, Karau, and Makhijani (1995: 138-139) acknowledge that the “favoring of subjective ratings of leaders’ performance raises questions of validity because such judgments do not provide pure measures of leaders’ actual performance…[and because their] vulnerability to bias is well documented.”

While the gender and leadership literature might not have clear predictions on the effect of manager gender on objective worker productivity in female-typed workplaces, this literature has probed mechanisms that might explain why male and female leaders differ in their perceived effectiveness, focusing on differences in “leadership styles” (Eagly and Karau 2002; Brands et al. 2015). Women, for instance, are hypothesized to adopt a participative or democratic style, in which they encourage employee participation in decision-making, more often than men (Yukl 1989; Eagly and Johnson 1990; Eagly et al 2000). Similarly, women are hypothesized to be “transformational” in their leadership style, focusing on the development and mentoring of their subordinates and attending to their subordinates’ individual needs (Eagly and Johannesen-Schmidt 2001; Eagly, Johannesen-Schmidt, and van Engen 2003). However, recent scholarship has critiqued the concept of leadership style as being a multi-dimensional construct that lacks a clear conceptual definition or careful specification as to how different dimensions of style are included, excluded, or combined to denote the overall style and has recommended that “going forward,…
theory and measurement concentrate on conceptualizing and operationalizing more precise and distinct elements and effects of leadership” (van Knippenberg and Sitkin 2013: 3).

Motivated by these gaps in the existing literature, in this paper, we study actual effectiveness rather than perceived effectiveness of male and female leaders. The productivity of front-line workers is increasingly measurable due to advances in technology and we exploit one such technology to obtain an objective and reliable measure of supervisor effectiveness. Our paper also moves away from the vague construct of leadership style to investigating a specific practice adopted by male and female managers in motivating worker productivity. Before stating our theory and hypotheses (developed through our qualitative data), we describe our setting for this study.

RESEARCH SETTING: GARMENT FACTORY IN INDIA

Our setting for this study is a large garment manufacturing firm in the southern Indian city of Bangalore, an organizational context that is rarely represented in management research (Budhwar and Debrah 2013). Garment manufacturing is a female-typed industry (Harkess and Warren 1994) that offers front-line employment to millions of women in the Global South, yet we know little about how women fare in leadership positions in this industry, a factor that may determine whether women will continue to receive opportunities for career advancement and growth in this sector. In India, this industry is also an important sector of the economy, contributing 4% to the country’s GDP, 13% to its export earnings, and 14% to its industrial production (Technopak 2015); therefore, this is a context where achieving high worker productivity is crucially important.

The factory that we study was established in 2001 and is one of the market leaders in the Indian garment industry, reporting an average annual revenue of $400 million. We gained access to the firm by approaching the CEO through an industry association. This factory produces both
menswear and womenswear, but focuses primarily on trousers and jackets for men. The factory produces an average of 100,000 trousers and 40,000 jackets per month. The factory recruits workers from villages surrounding the factory, where the unemployment rate is about 5% (Ministry of Labor 2016). Workers in this factory, in line with the norms in the industry, are not unionized or organized in any worker association (Gross and Kharate 2017). The factory’s workforce is over 90% female, consisting of 1,800 female workers; unfortunately, there are not enough male workers in our qualitative and quantitative datasets to theorize about them.

The factory that we study has a relatively flat organizational structure. In this paper, we focus specifically on the supervisors in the factory, who occupy the first level of the managerial hierarchy above factory workers. Typical tasks performed by a supervisor include moving pieces along the line to maintain a constant production flow, identifying bottlenecks and easing them in a timely manner, managing technical and non-technical production issues that arise, and motivating workers to maintain high levels of productivity. This factory currently employs over 50 supervisors. Historically, supervisors in garment factories have been male, especially in the developing world (Macchiavello et al. 2015), but a key benefit of our factory being a norm-breaking market leader is that both men and women are represented equally in the same supervisory role. Based on a survey of 32 supervisors who participate in our experiment, we know that the supervisors are, on average, 30.5 years old, have 11 years of education, and have been in the factory for 9 years. In this paper, we investigate whether male and female supervisors motivate worker productivity differently, and if so, how they differ.

**FULL-CYCLE RESEARCH DESIGN**

To investigate whether and how manager gender might affect worker productivity at the factory, we adopted a full-cycle research design, which is novel with respect to the gender,
industrial and organizational sociology literatures. This approach combines inductive and deductive methodologies in a cyclical manner in a single research program (Fine and Elsbach 2000; Chatman and Flynn 2005). The logic is that initial qualitative data can richly describe real-world issues that are worth studying and generate theory and hypotheses close to the field or immediate experiences of informants; quantitative data can then identify simple, generalizable causal relationships; finally, subsequent field data probes deeper into the findings underlying the causal relationships. Our research methods in this paper mirror this process.

**Qualitative Methods**

To inform our theory and hypotheses, we first conducted eighteen months of ethnographic observation in the factory between April 2014 and September 2015, producing more than 800 single-spaced pages of fieldnotes. To capture a range of experiences, we also conducted 120 in-depth interviews with a subsample of people at all levels of hierarchy within the factory—workers, supervisors, and upper management—in Kannada, Hindi, and English. Throughout our involvement with our field site, we described our project to informants very broadly as an attempt to understand the work of garment manufacturing.

The initial phase of the ethnography was open-ended as we sought to inductively understand how production was managed in the factory and how workers and supervisors interacted and worked together. We regularly sat in on meetings between factory staff members during which different aspects of factory life were discussed, such as managing the workforce, limiting worker absence, attrition, and dealing with technical issues in production.

The later phase of our ethnographic observation was focused on understanding the effectiveness of male and female supervisors in managing worker productivity and worker responses to various practices adopted by male and female supervisors. We shadowed supervisors
and workers both inside and outside the factory and observed supervisors’ interactions with workers to understand how they dealt with common challenges that they encountered during production, such as machine breakdowns, slow production, worker conflicts, and pressure from superiors. In our interviews, we asked male and female supervisors how they decided what managerial practices to use and how they dealt with people both below and above them in the organizational hierarchy.

We analyzed our data inductively as we collected it (Glaser and Strauss 1967), generating fledgling theories that we would evaluate in subsequent fieldwork. Coding was done primarily by hand or using Excel (Hahn 2008). We also wrote memos to refine our understanding of how male and female supervisors differed in their approach to managing worker productivity (Denzin and Lincoln 1994). This iteration between the collection and analysis of data produced hypotheses pertaining to male and female supervisors’ effectiveness in motivating worker productivity, their differential adoption of managerial practices and workers’ reactions to these practices.

**QUALITATIVE FINDINGS AND HYPOTHESES DEVELOPMENT**

**Supervisor Gender and Worker Productivity**

We began our fieldwork by observing and understanding the job of a supervisor at the garment factory. In the words of one supervisor, the crux of their job was to “get workers to keep finishing pieces and moving them along” so that production on the line progressed at a desirable pace. Our fieldnotes indicate that we “heard this phrase – keeping the pieces moving – many times in exactly the same language from many workers and supervisors.”¹ While getting workers to keep moving pieces might sound relatively easy, an experienced supervisor explained that this was

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¹ Any quotations in this section that are not attributed to specific informants are from our fieldnotes.
challenging: workers were prone to stalling and taking breaks, given the monotony of their work, a problem that had to be overcome because “without the workers, no work can be done.”

Our observations indicated that female supervisors seemed to be more effective at getting workers to keep their pieces moving than male supervisors. For example, recounting an incident that occurred earlier in the day, one worker said, “Two to three operators were holding up the entire back parts production. The fabric was such that the vacuum in the machine of the problematic worker was not able to hold it in place, making it hard to do the back pocket operation. [My female supervisor] sat down and demonstrated how to do it correctly,” thus resolving the issue. We heard a similar story when “a lady in the line kept attaching sleeve pieces to the main body without realizing the difference in size between the two separate pieces” and if the female supervisor “hadn’t fixed [the issue], the entire line would have come to a stop.” One female supervisor added that sometimes, she had to solve workers’ personal problems in addition to their production problems because these problems “affected their production.” She went on to describe that “if a worker is happy, she may do 5 extra pieces [but] if she is sad, she may do 5 pieces less. So I have to see if someone’s face is happy or dull, understand that and treat them accordingly.”

According to our fieldnotes, lines managed by female supervisors seemed to “run smoothly” and seemed to be characterized by “less shouting and yelling” and more productive interaction than lines managed by male supervisors. In fact, 75%, 73% and 77% of the workers we interviewed reported that they preferred going to a female supervisor than a male supervisor about questions related to production, quality problems, and conflicts with other workers, respectively.

In contrast, workers described male supervisors as less effective at keeping pieces moving. Male supervisors employed demonstrations of authority to get workers to keep their pieces moving, an approach that has been documented in prior work (Eagly et al 2000). One male
supervisor warned, “If you give the workers too much lenience, they will take the supervisors for a ride. They wander around and supervisors won’t have control over them. They begin to regard supervisors as their own family members and take advantage of this familiarity.” Male supervisors often raised their voices, yelling instructions and shouting at workers if they made mistakes. Male supervisors did not ascribe any special value to conversation with workers and often saw it as a hindrance to work. One male supervisor said, “That is the problem with these women. They are always talking.”

However, this style of monitoring by authority did not seem to resonate with the female workers at the garment factory. A group of workers described that when male supervisors encounter problems in production, “They give very broad level instructions, not getting into the depth of the problem. They also keep asking why [the worker] isn’t performing well,” which the workers described as being an unproductive approach. Speaking about a male supervisor, a worker said, “When there is pressure to move 10-20 pieces, male supervisors here shout at people. …They do not have the ability to gauge an operator’s capacity and they just yell at them to produce more without understanding why they may not be able to produce.” This worker clarified that male supervisors’ inferior effectiveness did not stem from lack of effort or ill intentions, but instead from their efforts not translating into results.

This data is reminiscent of the different leadership styles adopted by male and female managers, as highlighted by past research (Eagly and Johnson 1990; Eagly and Johannesen-Schmidt 2001). This research has additionally pointed out that the aspects of leadership style more likely to be adopted by women than men relate positively to leader effectiveness (Eagly, Johannesen-Schmidt and van Engen 2003). While these studies have not investigated actual,
objective effectiveness of male and female managers, based on these predictions from literature along with our observations, we hypothesize:

**Hypothesis 1**: Female supervisors motivate greater worker productivity than male supervisors in female-typed workplaces.

Our next goal was to understand why female supervisors seemed to be more effective than male supervisors at motivating productivity. While there may be a number of reasons for this difference, in the next section we focus on one that seemed especially salient in our observation yet is unexplored in the literature.

**Managerial Practice of Subordinate Scut Work**

Having observed female and male supervisors at work, we were intrigued by how female supervisors motivate greater worker productivity in this female-typed garment factory. Our observation uncovered a novel managerial practice that female supervisors were much more likely to perform than were their male counterparts. Female supervisors engaged in the routine tasks of their subordinates alongside them, a practice that we call *subordinate scut work*. Here, we build on the concept of scut work from the professions literature, used to describe menial work performed by professionals in the service of clients (Hughes 1958; Pratt et al 2006; Kellogg 2010; Huising 2014). Describing this practice, one female supervisor said, “This is also a skill…better than just supervising is to be on our feet helping out. … A real supervisor is one who can do this, right?” Our interview data further seemed to indicate that this practice was easily accessible to female supervisors and effective for them given that their subordinates’ routine tasks in this female-typed workplace were also female-typed, in line with the longstanding research on the effects of gender-typing of work (Ridgeway 2011; Doering and Thebaud 2017).
We observed female supervisors partaking in a variety of routine tasks of their subordinates such as cleaning up, ironing garments, and performing alterations on finished pieces with errors. One female supervisor “constantly kept folding the sleeves of the jackets inside out, making them easier to work on” and another “constantly kept picking up pieces that fell off workers’ desks and transferring them to the next worker,” as described in our fieldnotes. Female supervisors described that they perform such tasks “4-5 times a day at least.” Explaining this tendency to perform subordinate scut work, one female supervisor said, “If there are small problems like loose stitches in finished pieces, I resolve them myself—I don’t bother my workers with these annoying jobs.”

Perhaps the strongest and most common illustration of female supervisors’ enactment of subordinate scut work that we observed was supervisors sitting alongside their subordinates and stitching garments. Given that workers in this context engaged in unglamorous, menial garment operations and supervisors had earned the right to escape from this work, we interpreted female supervisors performing the front-line work of their subordinates alongside them as significant evidence of them “leading by doing.” We often observed female supervisors sitting at empty machines and stitching garments. When we asked supervisors whether they participated in stitching garments, 90% of female supervisors replied affirmatively whereas less than 50% of male supervisors did so. Interestingly, 100% of the male supervisors we asked acknowledged that female supervisors participated in front-line work. It is important to note that even if supervisors chose to stitch garments in the production lines, their own production was not included in the calculation of individual worker productivity because supervisors signed in to workstations by scanning their own identification cards before they started stitching. So, even though female supervisors’ performance of subordinate scut work could directly raise productivity of the line, we are interested in the indirect effects of this practice on their subordinates’ individual productivity.
In interviews, we asked female supervisors why they engaged in subordinate scut work. While they stated a few different reasons, what was most salient was that female supervisors did not see the work of their subordinates as being low-status or inaccessible, possibly because the tasks of their subordinates were female-typed. Describing the work of stitching, for example, one supervisor said “I have interest in this work” and another said “This work fits me.” In interviews, female supervisors often spoke about how they saw front-line participation as normal and emphasized that this practice made them feel “closer to their workers…[and made them] feel as though they were part of the team.” One female supervisor said, “If I pitch in and work too, then the operators feel that I am one among them.” A senior executive agreed, “[Female supervisors] don’t mind just sitting and working alongside workers. Without any second thoughts, they just sit in the line and work.”

In contrast, male supervisors, despite knowing how to perform the female-typed tasks of their subordinates, did not want to be associated with doing what one supervisor called “women’s work.” Our fieldnotes describe that “male supervisors don’t seem to physically perform any worker tasks but just direct people to do them.” We observed male supervisors overseeing the production activity of their workers, walking down the lines, giving instructions and scrutinizing the work without touching the garments or “getting their hands dirty.” In interviews, male supervisors described stitching as a “low status task…[that was] beneath them.” Male supervisors variously justified their decision to not perform subordinate scut work by saying, “Stitching is not my work” and “I am a supervisor, so I do not need to do my workers’ tasks.”

We did, however, observe male supervisors doing subordinate scut work under some limited conditions. In particular, we saw male supervisors trying to help their workers fix machines, which is one of the rare male-typed tasks in this work environment. Our fieldnotes
describe how one male supervisor “calmly sat down at a machine that was problematic and started tinkering with it” while another “was very hands-on in his problem solving approach to fixing the steam machine that was unable to take more water.” When we asked one worker about this, she said, “[My male supervisor] knows all the operations in the line quite well, but he only helps with machine-related activities. …Only this makes him feel comfortable.” A senior executive agreed saying, “even male sups sit and produce, the difference is in the job they do.” When we asked a male supervisor why he only helps with machine activities and not with stitching activities, he said, “I can’t challenge the mentality around here,” indicating his awareness that gender norms pervade the garment factory and affect the enactment of various management practices.

Overall, given the rarity of such male-typed routine tasks in this female-typed work environment, we observed many more instances of female supervisors doing subordinate scut work than male supervisors. Female supervisors further had some intuition that their performance of subordinate scut work would improve worker productivity. One female supervisor said, “If I sit with them, a worker who would produce 80 pieces in an hour would easily finish 100 pieces.” Others added that their performance of scut work “improves the production” and results in workers “working much faster.”

The professions literature has long theorized about scut work as a rite of passage into a profession (Hughes 1958; Abbott 1988; Pratt et al 2006; Kellogg 2010) or as a tactic to build relationships with clients and later elicit compliance from them (Huising 2014). Bringing this concept to the study of management in organizations, we introduce the idea of subordinate scut work as a tactic in which managers voluntarily perform routine work of their subordinates in order to improve worker productivity. In fact, we have come across anecdotal accounts of managers doing subordinate scut work in a variety of settings including at airlines and hospitals, and among
firefighters and engineers (Weick 1996; Gittell 2002, 2003; Bersade and Meisiek 2004; Leonardi and Bailey 2008). Additionally, building on the gender research highlighting that the gender-typing of work roles affects the behavior of incumbents to the role (Ridgeway 1997, 2001), we theorize that the gender-typing of tasks of subordinates could similarly affect male and female managers’ performance of subordinate scut work. Based on this literature along with our qualitative data, we hypothesize:

**Hypothesis 2**: Female supervisors motivate greater worker productivity than male supervisors in female-typed workplaces by performing subordinate scut work.

**Improving Subordinates’ Engagement with their Work**

We then sought to understand the effect of female supervisors’ performance of subordinate scut work on workers. In-depth interviews with the workers and supervisors suggested that female supervisors doing scut work increased subordinates’ engagement with their work. Engagement with work has been defined in the literature as investing personal energy in work—becoming physically involved, cognitively vigilant, and emotionally connected with a task (Kahn 1990). We refer here to individual engagement with work rather than group engagement, given our individualized work context (Metiu and Rothbard 2012). Scholars have argued that workers can be more or less engaged when performing the same task (Rothbard 2001). For example, an engaged traffic policeman might embrace his role with “arms dancing and whistle blowing” but someone else might “distance himself…yawning and mock-grimacing” (Goffman 1961:108). Other scholars have argued that engaged workers might experience elevated “affective states,” offer high-fives to colleagues and have higher attention focus (Collins 2004; Grodal et al 2014).

Our observation indicated that female supervisors’ subordinate scut work increased workers’ engagement with their work. One female supervisor explained, “Workers feel touched
that their supervisors are doing work that is actually the worker’s own work” and this act changes how workers approach and connect with their work physically, cognitively, and emotionally. Describing her physical response to subordinate scut work, one worker said, “Seeing my supervisor doing my own work…I put in extra effort, my hands work faster and I get the work done.” In fact, we saw this worker voluntarily work during her lunch break. She explained, “I want to finish up some more pieces before I go to eat.” Cognitively, too, we saw workers connect more deeply with their work. One worker said, “If she [my supervisor] too sits down and works with us, I like the work more” and another worker said “I feel I should match her work through my own work.” And finally, workers seemed to experience heightened emotions when their supervisors did subordinate scut work. Our observation noted workers smiling and laughing more when their female supervisor worked alongside them. One worker said, “I feel very good when my supervisor works with me” and another said, “I feel happy.” In one instance, we observed “a female supervisor altering a piece done by a worker, [after which] she pointed to the piece and playfully said to the worker ‘Look what you have done!’ [In response] the worker laughed.”

Interestingly, our observation suggested that workers seemed to become more disengaged with their work when their female supervisors employed authoritative managerial tactics. Disengagement with work is defined as the “withdrawing of oneself, physically, cognitively, and emotionally” from the performance of a task (Kahn 1990: 694). When female supervisors adopted top-down managerial practices, we saw workers yawn and stretch and complain that their job was “boring” and “annoying.” Others “star[ed] blankly at their machines, for up to half an hour sometimes.” Responding to her female supervisor’s order to work faster, one worker said that “it is like asking a dumb person to talk when they clearly can’t. … It has no effect on me.”
That being said, workers thought it would be strange and unusual for male supervisors to perform subordinate scut work, perhaps because most of the routine production tasks in the factory were female-typed. A male supervisor who sometimes participated in production activity said, “I visited another factory recently. There, supervisors are not allowed to do production... [and] those supervisors get a lot of respect. . . , I get no respect because I myself sit down and work.” When asked about this particular male supervisor, two female workers said that he “behaves like a mental [crazy] person” for helping in production activities and “has not moved up the ladder at all.” Workers thus perceived the practices of male and female supervisors quite differently, especially with respect to subordinate scut work. The engagement with work that female supervisors’ performance of scut work stimulated did not seem to occur when male supervisors stitched garments. That said, when male supervisors undertook male-typed subordinate scut work in the female-typed environment, their subordinates did seem to be engaged. For example, seeing a male supervisor tinkering with a machine, a worker said “it is good for supervisors to have a connection with the machine always, it makes me want to work harder.” However, such occurrences were rare within the female-typed garment factory.

The literature on engagement with work has considered how job design (Kahn 1990), socialization tactics (Cable, Gino and Stats 2013) and family responsibilities (Rothbard 2001) can affect the extent to which an individual is engaged with their work. However, this literature has not considered how supervisors who directly interact with workers and are responsible for motivating productivity can influence subordinates’ engagement with their work. Based on our qualitative data, we hypothesize:

**Hypothesis 3**: Female supervisors’ enactment of subordinate scut work increases female subordinates’ engagement with their work.
Supervisor Gender and Managerial Pay Inequality

Having observed female supervisors’ performance of subordinate scut work and the effect of this practice on workers’ engagement with work and productivity, finally, we sought to investigate how female supervisors were economically valued at the factory as compared to their male counterparts. To make progress on this, we interviewed senior executives at the factory.

Our interviews revealed that upper management at the factory did not value being participative and performing subordinate scut work as important traits for supervisors. Instead, interviews with top management revealed their opinion that “supervisors have to be dominant on the line” in order to be able to get better performance from workers. One senior executive said, “we always tell female supervisors not to sit at the machine and work…they do not need to engage in production, they need to make the workers improve their production.” The same executive went on to say, “good supervisors tend not to participate in the work.” Further interviews similarly confirmed that the practice of subordinate scut work adopted by female supervisors was discredited by upper management, who deemed that asserting authority was a necessary element of managerial success. In fact, upper management believed that “workers would perform better under male supervisors than under female supervisors.”

The devaluation of women in management has been predominantly measured in the literature through economic compensation: scholars have extensively studied the managerial ‘gender wage gap’ - i.e. the differential monetary value accorded to the work of female and male managers by upper management within an organization (for a review, see Cohen and Huffman (2003b)). These scholars have found that work done primarily by female managers is rewarded less than work done by men, both for broad occupational categories (England et al. 1988; England 1992; Cohen and Huffman 2003a) and for specific job titles in work establishments (Bridges and Nelson 1989; Baron and
Newman 1990; Tomaskovic-Devey 1993; Petersen and Morgan 1995; Huffman and Velasco 1997. However, we theorize that this devaluation of female managers persists and is perhaps even fueled by their adoption of productivity-enhancing practices such as subordinate scut work. Therefore, while our fieldwork suggests that one key reason female supervisors might be more effective in motivating workers is because of their willingness to perform subordinate scut work, it is possible that this same practice might hurt their careers and result in their devaluation by upper management at the factory. Based on our qualitative data, we hypothesize:

**Hypothesis 4**: On average, female supervisors earn less than male supervisors in female-typed workplaces.

Having deriving four testable hypotheses based on our fieldwork, in the next sections, we quantitatively test each one using personnel data and a field experiment.

**OBSERVATIONAL QUANTITATIVE DATA: SUPERVISOR GENDER AND WORKER PRODUCTIVITY**

To test Hypothesis 1, we use detailed personnel records maintained by the factory to construct a dataset of over 10,000 observations at the worker-date level, where each data point corresponds to productivity for a specific worker on a specific date. We have data for the individual daily productivity of 199 female employees who worked in one trouser line in the factory from January 2013 to October 2014. The line we study had less than 20 male workers, whom we drop as no statistically valid conclusions can be drawn from this small sample. Although the factory had over 1,800 workers, our sample for this analysis is smaller because the system used to track individual worker productivity was not widely-implemented in the factory due to cost constraints. For robustness, we also replicate our results in our lab-in-the-field experiment, discussed later.

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2 Our results are robust to keeping this small set of male workers in the sample.
Workers in this factory are assigned to production lines and perform specific tasks called “operations,” such as attaching a zipper or a waistband, which they typically repeat several hundred times over the course of a day. The factory introduced an Radio Frequency Identification (RFID) system in October 2012 to systematically collect and store real-time data on worker productivity for a small section of the factory. This section was chosen as part of a pilot for its physical proximity to the Industrial Engineering department responsible for implementing the system. The RFID system consists of RFID tags attached to each garment and RFID terminals attached to workers’ stations. When a worker finishes working on a garment, she scans the tag attached to the garment on the RFID terminal at her workstation and then passes the garment to the next worker in the production line. This facilitates tracking daily variation in individual worker productivity.

Additionally, we obtained detailed data on weekly supervisor assignments in this line over the 2-year period. By merging the worker productivity dataset with the supervisor assignment dataset, we were able to create a unified dataset that could track the productivity of a female worker under her assigned supervisor on a particular date. We were also able to obtain a comprehensive dataset on the demographic characteristics of the female workers in this line. This includes employee characteristics such as age, marital status, and education as well as employee-workplace characteristics such as tenure, skill level, and career progression within the factory.

**Causal Identification Strategy**

In order to test the effect of supervisor gender in motivating female worker productivity, a first step would be to conduct a cross-sectional comparison of the productivity of workers assigned to male supervisors versus those assigned to female supervisors. However, this comparison could be misguided because supervisor assignment could be correlated with specific characteristics of workers. For example, if more skilled female workers were systematically assigned to male
supervisors, then it would be difficult to identify if the workers’ higher productivity was due to the supervisor’s gender or due to the workers’ skills.

To overcome the above issue, the ideal experiment would require within-worker changes in supervisor gender to measure the productivity of the same female workers under male and female supervisors. Our setting offers such a natural experiment through the quasi-random rotation of supervisors across garment lines. Production activity in this factory is organized into twelve garment lines. Supervisors are rotated through the different lines, thus both male and female supervisors supervise the same workers at different points in time. The assignment of supervisors to lines is done by higher-level management; the supervisors and workers themselves have no choice in this matter. The key purpose of the supervisor rotation is to produce “multi-skilled” supervisors who can manage multiple garment lines. The assignment of supervisors to lines is thus quasi-random and more importantly, not correlated with worker performance. A given line may experience a change in supervisor as frequently as every week, although the average frequency of supervisor changes is lower.

By comparing the productivity of the same workers under male and female supervisors, we eliminate concerns about cross-sectional differences in individual worker characteristics. We are thus able to run panel regression models with worker fixed effects in order to establish a causal relationship between supervisor gender and worker productivity.

**Dependent Variable: Individual Daily Worker Productivity for Female Workers**

In trying to assess the effectiveness of male and female supervisors in motivating productivity in a female-typed workplace, the ideal dependent variable is one that (1) the supervisors have a direct impact on and stake in, (2) is based primarily on individual, rather than
organizational, productivity, and (3) is available on a consistent basis for all workers. Our choice of individual daily worker productivity satisfies all the above criteria.

The productivity of workers in the factory is measured as a percentage value calculated using two parameters: a worker’s output per minute in a given operation, measured as the number of pieces produced by the worker in a given operation in a minute, and the Standard Minute Value (SMV) for that operation, a concept commonly used in industrial engineering to denote the time required for a typical worker performing at “standard productivity” to perform that operation. It serves as a proxy for the complexity of a task: a more complex operation has a higher SMV. Individual worker productivity is then calculated as Output per Minute * Operational SMV * 100, making worker productivity comparable across multiple operations.³

**Independent Variable: Gender of the Supervisor**

Our primary independent variable is the gender of the supervisor on a given day in the line being studied. In our dataset, the 199 female workers were supervised by 8 supervisors, of which 3 were women. Given the small number of supervisors in this dataset, we replicate our results in our lab-in-the-field experiment for which we had a different, larger sample of 32 supervisors. Also note that despite the limited number of supervisors, we have over 10,000 observations in our dataset since individual productivity observations are at the worker-date level.

**Control Variables**

In our quantitative analyses, we control for a set of worker demographic characteristics, including age, tenure in factory, and skill level that could affect worker productivity. We also control for time-based variation in the production cycle in two ways. First, production may vary

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³ For example, the SMV for the “zip attach” operation is 0.52 minutes and the SMV for the more complex “waistband attach” operation is 1.29 minutes. Thus, a worker attaching 1.5 zips per minute and a worker attaching 0.6 waistbands per minute would have roughly the same productivity of 78% because the worker productivity measure accounts for the varied complexity of operations.
within a year in accordance with seasons in the fashion industry (Fall/Winter and Spring/Summer): certain months of the year may see more production activity than others. Second, production may vary across years. Our interviews with the factory production managers indicated that some years are better than others in terms of overall business. In order to account for this time variation, our regression models include month and year fixed effects.

**QUANTITATIVE RESULTS: PRODUCTIVITY OF FEMALE WORKERS UNDER MALE AND FEMALE SUPERVISORS**

As a first step, we produce descriptive statistics for the 199 female workers in our dataset, presented in Table 1. The average daily productivity of workers in the sample was 59.6%. Of particular interest to our research question is the average fraction of an individual worker’s time that she was exposed to a female supervisor. We see that a female worker in this setting was, on average, equally exposed to both male and female supervisors. Although only 3 of the 8 supervisors were female, an average worker was supervised by a female supervisor for about 50% of her time because different supervisors managed this garment line for different spells of time.

**INSERT TABLE 1 ABOUT HERE**

Before we test Hypothesis 1 regarding the effectiveness of female and male supervisors in motivating worker productivity, we wanted to check that the *timing* of the assignment of supervisors to lines is indeed quasi-random. While our research design of exploiting within-worker changes in supervisor gender controls for differences across workers, we might be concerned that male supervisors had shorter spells and were switched out of lines too quickly, before worker performance could peak, or that female supervisors were systematically assigned to lines when workers in the line were already becoming more productive. In order to investigate this concern, Figure 1 depicts the trend in mean individual worker productivity when a female supervisor replaces
a male supervisor compared to when a male supervisor replaces a female supervisor. On the x-axis, we plot time in relation to the supervisor gender change event. Before the supervisor gender change event, we observe parallel trends in productivity, demonstrating that productivity was not increasing prior to women supervisors replacing men. However, after the supervisor gender change event, the mean individual worker productivity rises more steeply when a female supervisor is assigned to the line than when a male supervisor is. This offers preliminary evidence that female supervisors might be more effective than male supervisors at motivating worker productivity.

In order to systematically test our observations from Figure 1, we ran least-squares regression models at the individual worker-date level. The model compares daily worker productivity under female supervisors versus male supervisors. Model (1) controls for worker age, tenure in the factory, and skill level to account for the effects of these variables on worker productivity. However, it is difficult to establish causality in Model (1) because the composition of the garment line changes over the two-year period of observation, as some new workers enter the line and others leave. Thus it is possible that the composition of workers being supervised by male and female supervisors is slightly different. To control for all possible differences across workers and establish causality, Model (2) includes worker fixed effects, wherein we use dummy variables for each female worker in our dataset. In addition, time fixed effects are included to control for seasonal variation. Standard errors are clustered by individual female worker in both models.

Table 2 reports the results of the regression. Model (1) finds no significant differences in the effectiveness of male and female supervisors in motivating worker productivity. However, in Model (2), we find that female supervisors are more effective at motivating productivity among workers in the female-typed garment factory than male supervisors, thus offering support for
Hypothesis 1. Individual worker productivity improves by 2.79 units under female supervisors as compared to male supervisors. Given that the average daily productivity is 59.6, this amounts to a 4.7% productivity increase under female supervisors. In this way, our personnel analysis causally estimates the effectiveness of male versus female supervisors in motivating worker productivity. To allay any concerns about our small supervisor sample in these analyses, we further replicate these results with a sample of 32 supervisors in our experiment, described below.

**EXPERIMENTAL DESIGN: TESTING PRACTICE OF SUBORDINATE SCUT WORK**

Our next task is to test hypotheses 2 and 3, that female supervisors inspire higher productivity from their female workers because of their performance of subordinate scut work and that female supervisors’ enactment of subordinate scut work fosters engagement with work. To do so, we designed and implemented a lab-in-the-field experiment in the garment factory.

Lab-in-the-field experiments represent a relatively new addition to the social scientist’s toolkit. The idea is to run behavioral games in a controlled experimental setting within the field site to gain insights into human behavior (Baldassarri, 2015; Gneezy and Imas 2016). This important tool offers us the best of both worlds: the chance to study specific mechanisms in a lab in isolation from confounding factors, but not in isolation from the rich context that the field setting provides. We received permission from factory management to independently design and run such an experiment; note that the experiment was not financially sponsored by the factory.

**Experimental Participants.** As a first step, workers were offered the opportunity to voluntarily sign up to participate in the experiment. We called our experiment a “production game” to encourage participation as workers had mentioned to us that they enjoyed playing games during the factory’s Annual Day celebrations. The sign-up procedure was advertised to all workers
in the factory for seven days through flyers and announcements in the local language. The flyers clearly stated that the game would be conducted by researchers from a university and was neither sponsored by nor connected to the factory management in any way. No specific details about the purpose or design of the experiment were revealed at this stage, so it is very unlikely that the workers who volunteered were familiar with the research agenda. Sign-ups were conducted during lunch for seven days in the factory canteen, where workers could approach research assistants seated at a prominently placed table to register to participate. The voluntary sign-up ensured that the workers who were eventually randomly picked to participate in the experiment were indeed available and interested in the game.

Workers were excited to volunteer and participate in a seemingly fun game. Such events relieve the monotony of the repetitive daily work that the workers engage in. In total, 345 workers signed up; about 15% of the workers who volunteered were male, however given that our qualitative and personnel dataset had no male workers, we restricted the actual experimental pool to female workers. The workers who volunteered were from all sections of the factory (such as quality inspection, jacket sewing, and trouser sewing) and not just the RFID section of the factory where we had spent the bulk of our time during fieldwork; the volunteer sample was about 3 years younger than our personnel data sample. In addition, we enlisted all supervisors in the factory who were available to participate in the game; note though that there was little overlap between our supervisor samples in the personnel records and the experiment. Each supervisor participated in only one experimental session, ensuring there was no repetition.

**Schedule.** The experiment was conducted over 16 days in September-October 2015 on the factory premises in a separate building with classrooms. The experiment was conducted in two phases, before and after a major Hindu festival. Experimental sessions were held at the end of the
workday during factory overtime hours. This ensured minimal disruptions to the factory’s production process. Factory-run buses were available to workers for a safe commute back to their homes. A session typically lasted 90 minutes, including bringing participants to the classrooms, running the game, and then conducting a brief survey. Before carrying out the experiment, we conducted a pilot study at another factory owned by the same firm to ensure no contamination of our research setting.

Each day of the experiment consisted of two sessions conducted in parallel, one run by a male supervisor and one by a female supervisor. There were 32 sessions in total. From the list of workers who signed up, we randomly assigned five workers to participate in each session. All participants were informed in advance and reminded on the day of their session. Since the factory has nearly 1,500 workers and the sign-up was voluntary, the supervisors and workers involved in a session typically did not have an existing working relationship prior to the day of the experiment; even if they did, however, the likelihood of this was randomly distributed.

**Design of the Production Game.** The production game consisted of a uniform task performed by the five randomly-selected female workers. The task was to individually sort brightly colored buttons under the supervision of a supervisor. Button sorting is a common activity performed by women in the production lines of the factory, so the exercise was familiar to the workers. Further, we modeled our button sorting exercise on prior research (Macchiavello et al. 2015). Our buttons were of four distinct colors, but were identical in shape and size. For the purpose of the experiment, supervisors participating in this task of sorting buttons is our proxy for them performing subordinate scut work. In particular, we test Hypothesis 2 through a restriction of female supervisors’ subordinate scut work – in other words, we test our theory by turning our proposed mechanism “off” rather than turning it “on.”
Control and treatment sessions were held on alternate days. So, on any given day, the two sessions that were run—one with a male and one with a female supervisor—were either both treatment or both control sessions. In control sessions, supervisors were allowed to manage workers as they saw fit. In treatment sessions, supervisors were not allowed to participate in the task of sorting buttons alongside workers, taking away their ability to adopt one key form of subordinate scut work. Specifically, if the supervisor in a treatment session attempted to sort buttons, the research assistant would ask him or her to stop. Note that the treatment here is thus a restriction of a managerial practice sometimes adopted by supervisors. There were no other restrictions, however, on how the supervisors conducted their respective sessions.

**Session Logistics.** Each session was held in its own classroom with no visual connectivity, so supervisors could not see what others were doing. Participating workers were first taken to a preparation room, where they listened to a pre-recorded set of instructions informing them that the supervisor conducting the game would explain all necessary details. Workers then took an “oath of secrecy” that bound them to not reveal details about the game to other workers who were yet to participate. Finally, the workers picked numbers in a lottery that randomly assigned them to one of the two classrooms with either a male or female supervisor. In a similar fashion, the male and female supervisors on a particular day were randomly assigned to one of the classrooms, where they listened to a pre-recorded set of instructions that explained the game. As a final step, when both the workers and supervisors were ready, workers were brought to their assigned classrooms, and the supervisors began orchestrating the button-sorting game.

Supervisors were tasked with explaining the activity as well as managing the workers’ productivity, allowing us to simulate the actual production lines in the factory as closely as possible. In addition to a large pile of unsorted buttons, each supervisor was given a timer and a
weighing scale to measure the numbers of buttons sorted. Much care was taken to ensure that the classrooms were set up to look identical day after day as the experiment progressed. The game lasted for a total of 25 minutes, after which surveys were conducted for all participants by surveyors hired for this project. Each survey typically took 15 minutes and consisted of questions on a range of topics including experiences on the shop-floor as well as in the production game.

**Payoffs for participants.** The supervisors were compensated based on the total number of correctly sorted buttons in their session in order to incentivize them to elicit better productivity from their workers. Each supervisor received a baseline compensation of 200 rupees and an additional 100 rupees for every 1000 buttons correctly sorted by their workers. Note that the factory does not typically provide such a performance-based incentive. The workers were each paid a flat rate of 150 rupees, in line with the hourly overtime rate for the workers in the factory.

**Data.** The key outcome variable in the game, used to test Hypothesis 2, was the individual productivity of each female worker, measured as the number of buttons she sorted correctly. To capture this data, each worker was given four boxes, one for each color of button. Supervisors were informed at the beginning of the game that failure to turn in separate boxes for each worker would result in a heavy penalty. Extra boxes were provided so that, if the supervisors themselves chose to sort buttons in the control sessions, their buttons would go into separate boxes so as not to affect our measure of individual worker productivity.

We also video recorded the sessions with the consent of the participants. Both supervisors and workers on factory production lines are used to being monitored closely and as such, this observation is unlikely to have caused any tension or affected their behavior. We first hired an independent contractor to translate (from Kannada to English) and transcribe all the dialogue that occurred in 30 out of the 32 experimental sessions (we were unable to record two sessions).
and we then hired a research assistant to code the content of the dialogue, for, among other
things, workers’ engagement and disengagement with work. Our engagement with work code
includes verbal indications of workers’ interest in the work as well as non-verbal indications
such as smiling and laughing (see Schaufeli, Bakker, and Salanova [2006] for a scale that
informed our coding). Examples of sentences coded as engagement include “Sister, I am
enjoying finding the pink button (She laughs)” and “The game is interesting.” Similarly, our
disengagement with work code includes verbal statements about lack of interest in the work and
non-verbal indications such as yawning. Examples of statements include “I am getting bored”
and “Madam, come on, can we do something else?” A simple count of the number of coded
instances of engagement and disengagement per worker in our data gave us individual worker-
level measures for engagement and disengagement with work that we use to test Hypothesis 3.

EXPERIMENTAL RESULTS

Table 3 summarizes the experimental design. Data from 14 control sessions and 18
treatment sessions was used for the analysis in this paper. The control and treatment sessions
were equally distributed between male and female supervisors, as indicated in Table 3. In total,
159 workers participated in the experiment; one observation is missing from a male supervisor-
treatment session as one randomly picked worker did not show up to her assigned session.

Table 4 offers descriptive statistics for every supervisor who participated in our field
experiment. The data was collected by survey. As indicated, there is no statistically significant
difference in age, education, marital status, state of origin, tenure, or work history between
supervisors in the treatment and control group, giving us confidence in our randomization.

Table 3

Table 4
Figure 2 presents a comparison of mean individual worker productivity measured as the average number of sorted buttons for each of the four experimental conditions: female supervisor-treatment, female supervisor-control, male supervisor-treatment and male supervisor-control, with confidence interval bars around the mean. It is important to note that even if the supervisor chose to participate in button sorting in the control sessions, their sorted buttons were not included in the calculation of individual worker productivity and hence worker productivity did not mechanically increase because of supervisory participation. This figure demonstrates that mean individual worker productivity was higher under female supervisors than under male supervisors in the control sessions, replicating the results observed in our quantitative analysis. Specifically, worker productivity was 7.2% higher in control sessions run by female supervisors than in control sessions run by male supervisors; this difference is statistically significant (difference=135.55, se=55.92). In contrast, in the treatment sessions, in which female supervisors were restricted from performing subordinate scut work, their productivity advantage disappeared and worker productivity was no different under female supervisors than under male supervisors, offering support for Hypothesis 2.

It is also worth noting that worker productivity seems to improve slightly in male treatment sessions as compared to male control sessions. While this difference is not statistically significant and our main focus in the experiment is to understand how female supervisors’ (rather than male supervisors’) effectiveness changes, we speculate that this might arise from male managers’ typical approach to management getting legitimated in the treatment sessions.

As a next step, we systematically test the comparison of raw means presented above through a least squares regression model (Table 5). This tells us if the difference-in-differences
in worker productivity across treatment and control sessions under male and female supervisors was statistically significant. Both models include an interaction between supervisor gender and treatment session, robust standard errors, and time fixed effects to control for differences across the two phases of the experiment, described earlier. In addition, Model (2) includes control variables for workers’ age, years of education, and marital status.

Of particular interest in this model is the interaction term between supervisor gender and treatment session. This interaction term represents (mean worker productivity \( \text{female-treatment} \) – mean worker productivity \( \text{male-treatment} \)) – (mean worker productivity \( \text{female-control} \) – mean worker productivity \( \text{male-control} \)). This is our variable of interest because we want to compare how worker productivity changes when we restrict female supervisors’ ability to perform subordinate scut work against the change in worker productivity between the treatment and control sessions under male supervisors. This estimate is statistically significant at the 0.05 level in both models, and the addition of control variables in Model (2) serves to strengthen the effect in Model (1). The experimental results thus demonstrate that the managerial practice of subordinate scut work is a key mechanism through which female supervisors achieve superior worker productivity, which supports Hypothesis 2.

**INSERT TABLE 5 ABOUT HERE**

Then, we sought to test whether female supervisors’ performance of subordinate scut work affected workers’ engagement with their work in the female-typed garment factory. Table 6 uses the same setup as Table 5—OLS regression models with individual worker level observations—to test this hypothesis. The outcome variable in Model 1 is engagement with work and the outcome variable in Model 2 is disengagement with work, allowing us to test whether the difference-in-difference in subordinates’ engagement and disengagement with work across treatment and control
sessions under male and female supervisors was statistically significant. Our count of observations drops from 159 to 150 since we do not have data for 9 workers because of our inability to video record two experimental sessions. Again, our variable of interest is the interaction term between supervisor gender and treatment session. This coefficient is significant in both models, but importantly, the direction of the coefficient is negative in Model 1, which estimates engagement with work, and positive in Model 2, which estimates disengagement with work. These results demonstrate that when female supervisors are restricted from doing subordinate scut work, their subordinates’ engagement with work decreases and their subordinates’ disengagement with work increases, thus supporting Hypothesis 3.

INSERT TABLE 6 ABOUT HERE

SUPERVISOR GENDER AND MANAGERIAL PAY INEQUALITY

Finally, we sought to test Hypothesis 4 that despite female supervisors’ greater effectiveness at motivating worker productivity through performing subordinate scut work, they earn less than male supervisors in female-typed workplaces. To test this hypothesis, we were able to obtain sensitive pay data for a subset of supervisors in the factory. In particular, though the factory employs more than 50 supervisors, they provided us with daily wage rate data for only 32 supervisors (21 female and 11 male supervisors). Note that all supervisors in this setting start at the same fixed wage at the beginning of their tenure as supervisors and subsequent wage revisions are then based on their perceived performance as discerned by upper management.

Using the available data, Figure 3 plots mean daily wages (in Indian Rupees) by supervisor gender. The figure reveals that the mean daily wage for male supervisors is higher than the mean daily wage for female supervisors by 14.8 per cent, a statistically significant difference. Male supervisors earned 475 rupees per day, which is significantly higher than female supervisors’
earnings of 413 rupees per day. This gender wage gap for the same managerial role, depicted in Figure 3, provides evidence for the devaluation of female supervisors in this setting and thus offers support for Hypothesis 4.

INSERT FIGURE 3 ABOUT HERE

DISCUSSION: HOW FEMALE MANAGERS MOTIVATE WORKER PRODUCTIVITY THROUGH SUBORDINATE SCUT WORK

We began with the research question, does manager gender affect worker productivity, and if so, how? To answer this question, we adopted a full-cycle research design to study a large Indian garment factory, a prototypical female-typed workplace, that employed male and female supervisors in the same role and had RFID technology to measure individual worker productivity. Through fieldwork, interviews, and surveys, we hypothesized that female supervisors motivate greater worker productivity than male supervisors in female-typed workplaces by doing what we call subordinate scut work, routine tasks of their subordinates, which increases subordinates’ engagement with their work. Our qualitative data suggested that female supervisors are more likely to do subordinate scut work in female-typed workplaces and are more effective when they do, given the female-typing of their subordinates’ tasks. Next, using personnel data and exploiting within-worker changes in supervisor gender, we ran panel models with worker fixed effects and confirmed that female supervisors increase worker productivity by approximately 5%. Then, using a lab-in-the-field experiment, we causally tested the mechanism of subordinate scut work. We found support for this mechanism and further showed, through coding of experimental videos, that female supervisors’ subordinate scut work increased workers’ engagement with their work. Finally, we demonstrated that despite their greater effectiveness at motivating worker productivity, female supervisors earn less than male supervisors.
Alternative Explanations

In this section, we consider a few alternative explanations to explain why female supervisors are more effective than their male counterparts at motivating productivity among female workers. First, could female supervisors’ effectiveness be explained by gender-based homophily? Prior studies suggest that when there is manager-subordinate gender homophily, worker performance improves (McPherson et al., 2001; Castilla, 2011). However, homophily cannot explain our results: we argue that the interaction of manager gender and the performance of subordinate scut work is necessary to explain female supervisors’ superior effectiveness. In particular, our experiment demonstrates that female workers perform better under female supervisors in the control sessions as compared to the treatment sessions. If gender-based homophily was driving female supervisors’ effectiveness, then there should have been no difference between worker productivity under female supervisors in the control and treatment sessions, since the only difference between these sessions was supervisors’ ability to perform subordinate scut work. Based on this observation, we conclude that homophily is insufficient; female supervisors need to additionally engage in subordinate scut work to elicit superior productivity from their female workers.

As a second alternative explanation, could female supervisors’ effectiveness at managing workers in a female-typed workplace be explained by different work histories of male and female supervisors? The argument here is that if female supervisors had been factory workers prior to being promoted to managerial roles while male supervisors had not, this might explain the former’s superior effectiveness. However, female and male supervisors at this factory are similar along most dimensions, including whether they were workers before taking up their supervisory positions, thus ruling out the alternative explanation that career differences between male and female supervisors account for female supervisors’ superior effectiveness. Furthermore, even if there are other
differences between male and female supervisors, our experiment provides causal evidence that
one key mechanism, not necessarily the only mechanism, through which female supervisors
achieve greater worker productivity is their performance of subordinate scut work.

**Contributions to Industrial Sociology Literature on Motivating Worker Productivity**

Our study makes two contributions to the literature on worker productivity by focusing
on the role of gender. First, while the literature on the determinants of worker productivity in
industrial settings is vast (Barley and Kunda 1992), very few scholars have focused on the role
of manager gender, perhaps because of a lack of female managers in their settings. We find that
male and female managers are differentially effective at motivating productivity, suggesting that
going forward the literature should pay attention to the gender composition of managers in
understanding productivity.

Second, while existing studies on productivity have focused predominantly on studying
male-typed workplaces in the West (Acker 1990; Budhwar and Debrah 2013; see Bernstein 2012
for an exception), in this study, we focus on a female-typed workplace in a developing economy
context, a setting that is under-represented in management research despite employing a sizeable
portion of the global female labor force. By studying a garment factory in India, we uncover a
managerial practice – subordinate scut work – that challenges the traditional Weberian approach
to establishing authority through hierarchy, and improves productivity of female workers in the
Global South, yet is general enough to inform our theoretical understanding of tactics to motivate
workers.

**Contributions to the Sociology of Gender and Leadership**

This paper also makes four contributions to the literature on gender and leadership. First,
while this literature has predominantly focused on white-collar settings where subjective
measures of leader effectiveness are relevant (Eagly, Karau and Makhijani 1995; Eagly 2013), we investigate gender and leader effectiveness using objective measures of worker productivity. The literature has produced mixed evidence regarding whether male or female managers will be perceived to be more effective in female-typed workplaces (Pugh and Wahrman 1983; Williams 1992). Our study investigates objective effectiveness in a female-typed garment factory, finding that female managers are more effective than their male counterparts in motivating worker productivity. In this way, we highlight how different conclusions might be drawn about male versus female managers depending on how their effectiveness is measured.

Second, in response to recent work critiquing the concept of leadership styles as being “multi-dimensional” and “ill-defined” (van Knippenberg and Sitkin 2013), we build on the professions literature to theorize about a specific managerial practice, namely subordinate scut work, which could be considered a key element of some leadership styles. We also clarify the “pathway” through which this managerial practice operates, highlighting how subordinate scut work increases workers’ engagement with their work.

Third, while prior research has highlighted that female managers often adopt participative or democratic leadership styles, in which they encourage bottom-up employee participation in decision-making (Eagly and Johnson 1990), we demonstrate that female managers also “lead by doing” where they stoop down to the level of their subordinates and participate in their subordinates’ routine tasks. Our study further explains female managers’ performance of subordinate scut work in our female-typed context by suggesting that the adoption and effectiveness of subordinate scut work might depend on congruence between manager gender and the gender-typing of subordinates’ routine tasks.
Finally, in contrast to structural or human capital explanations, our study rules in a behavioral explanation, namely the adoption of subordinate scut work, to help account for the devaluation of female managers. We advance the existing literature on devaluation by positing that this very managerial practice, which enables female managers to be more effective than male managers, might be responsible for female managers’ devaluation because historically, management has been construed as a masculine enterprise, and our notions of leadership have focused on the desirability of stereotypically masculine qualities in leaders.

Contributions to Literatures on Professions and Engagement with Work

Our research also contributes to the professions literature that has long considered how professionals engage in scut work to elicit compliance from clients (Hughes 1958; Pratt et al 2006; Kellogg 2010; Huising 2014). In this paper, we expand the scope of scut work by bringing this concept to the study of management in organizations and demonstrating how subordinate scut work impacts worker productivity. Our research contributes to the literature on engagement with work as well (Kahn 1990; Rothbard 2001; Cable, Gino and Stats 2013). While prior studies in this literature have identified some factors that can affect individuals’ engagement with their work, our ethnographic data and lab-in-the-field experiment suggest how managers can measurably increase workers’ engagement with work by performing the work themselves.

Implications for Male Managers, Scope Conditions, and Future Research

While our paper is focused on the effectiveness of female managers in female-typed workplaces, we believe that our findings offer some lessons for male managers as well, even though what works for female managers might not necessarily work for male managers (see, for example, Vandello and Bosson 2012). Our field observation and interview data suggest that male supervisors were less prone to perform female-typed subordinate scut work in the garment factory.
and even when they did, it was not effective in motivating workers. That being said, we observed that male supervisors seemed to be relatively more comfortable engaging in subordinate scut work when the underlying routine tasks were male-typed, and when they did so, it seemed to be well-received by female workers. While such male-typed tasks were uncommon in our female-typed workplace, we speculate that male managers (like their female counterparts) can increase worker engagement and boost worker productivity by helping perform gender-congruent routine tasks of their subordinates. We hope that future research will systematically test this prediction, perhaps using our experimental setup with a different treatment condition where supervisors are forced to participate in female-typed and male-typed tasks of their subordinates.

More broadly, we suggest female-typed workplaces as a scope condition for our conclusions. We expect our findings to generalize across female-typed workplaces both in the developed and developing world, which collectively employ a sizeable portion of the global female labor force. In gender-neutral or male-typed workplaces, where subordinates’ tasks are not female-typed, we are less confident that female managers will outperform their male counterparts. In fact, we speculate that male managers might be able to motivate greater worker productivity by performing subordinate scut work in male-typed workplaces where routine tasks are more likely to be male-typed. We hope that future research will extend our study to gender-neutral and male-typed workplaces to advance our understanding of the interplay between manager gender and subordinate scut work in motivating worker productivity.

Finally, in this study, we uncover one managerial practice – subordinate scut work – underlying leadership styles and test one pathway through which this practice affects worker productivity, namely by improving subordinates’ engagement with work. We hope that future research will continue to investigate managerial practices and theoretically develop the notion of
subordinate scut work, perhaps by identifying other effects it might have on workers. For example, subordinate scut work might inspire workers to copy their managers (Perlow 1998) or learn from them (Argote 2012), and we hope that future work will investigate such alternative pathways through which subordinate scut work could influence worker productivity.

**Implications for Method and Practice**

This paper makes use of a full-cycle research design (Cialdini 1980; Fine and Elsbach 2000), which advocates for combining qualitative work with lab experiments; we contribute to this methodology by bringing a novel method that is rarely seen in management research, a lab-in-the-field experiment to the full-cycle model. We believe that a lab-in-the-field experiment offers two key advantages over lab experiments (Gneezy and Imas 2016). While lab experiments abstract from naturalistic settings and use a university lab environment to maintain tight control and eliminate confounds, a lab-in-the-field experiment retains the advantages offered by the university lab without sacrificing the naturalistic setting. Additionally, while lab experiments use student populations, lab-in-the-field experiments use relevant populations from the field, thus making the findings more believable. That being said, this methodology brings with it new challenges, in that researchers might need to be extra cautious to ensure the ethical treatment of human subjects in these naturalistic settings (Greenberg and Tomlinson 2004). So, while there might well be reasons to stick with lab experiments under some conditions, carefully designing and using lab-in-the-field experiments in the full-cycle model might offer better-quality tests of the hypotheses uncovered through the qualitative work.

Our findings, resulting from the richness of the full-cycle methodology, offer clear implications for organizations. First, organizations should consider the possibility that female managers might be more effective than male managers at managing worker performance in
female-typed workplaces, such as nursing and teaching, which continue to have disproportionate representation of men in management (Blum et al. 1994; Maume 1999). Second, organizations should embrace practices such as subordinate scut work that female managers are adopting to motivate greater worker productivity as these practices may be effective more broadly (Bersade and Meisiek 2004). Third, organizations should strive to creative gender-neutral jobs and break gender role stereotypes so that both male and female managers can effectively deploy subordinate scut work without repercussions to their own careers. Finally, organizations should consider using objective performance data, when appropriate, in compensating male and female managers in order to overcome gender bias (Baron and Newman 1990; Castilla and Benard 2010). In particular, female supervisors’ greater effort and effectiveness from performing subordinate scut work might be going unrecognized. Subordinate scut work requires effort and hard work but data from our fieldsite suggest that even though female supervisors motivate 5% greater worker productivity than male supervisors through subordinate scut work, they earn 15% less than their male counterparts. Thus, for female managers, the practical implications are less clear. On the one hand, female managers are more effective at their jobs when they perform subordinate scut work, which suggests that they should continue adopting this practice. On the other hand, the very adoption of this practice might be resulting in their devaluation in the workplace, leaving them in a bind until organizations create more inclusive workplaces.

In sum, what is clear from our research is that manager gender influences worker productivity and that subordinate scut work is a managerial practice that could be used differentially by male and female managers to motivate workers but that this same practice could also help sustain gender pay inequality – these findings offer novel theoretical insight as well as hold practical relevance.
REFERENCES
Countries. Routledge.


Ridgeway, C. L. 2011. Framed by Gender: How Gender Inequality Persists in the Modern


TABLES AND FIGURES

Table 1. Descriptive Statistics for Female Garment Factory Workers

<table>
<thead>
<tr>
<th></th>
<th>mean</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction Female</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>29.80</td>
<td>6.057</td>
</tr>
<tr>
<td>Fraction Married</td>
<td>0.719</td>
<td>0.451</td>
</tr>
<tr>
<td>Fraction from Karnataka state</td>
<td>0.935</td>
<td>0.248</td>
</tr>
<tr>
<td>Fraction Low-skilled</td>
<td>0.508</td>
<td>0.501</td>
</tr>
<tr>
<td>Tenure in Factory (in years)</td>
<td>2.871</td>
<td>2.357</td>
</tr>
<tr>
<td>Average Daily Productivity (percent)</td>
<td>59.58</td>
<td>20.27</td>
</tr>
<tr>
<td>Fraction of time exposed to Female Supervisor</td>
<td>52.79</td>
<td>37.57</td>
</tr>
<tr>
<td>Observations</td>
<td>199</td>
<td></td>
</tr>
</tbody>
</table>

Low-skilled accounts for two lowest categories in 4-category skill system as designated by the Government of India (Highly Skilled, Skilled, Semi-skilled and Unskilled); Average Daily Productivity calculated using daily output, taking into account variation between garment operations.

Figure 1. Mean Worker Productivity before and after Supervisor Gender Change

The figure demonstrates the change in slope in mean worker productivity when a female supervisor replaces a male supervisor (dotted line on the left to solid line on the right) as compared to when a male supervisor replaces a female supervisor (solid line on the left to dotted line on the right), while showing parallel trends prior to the supervisor gender change event. On the x-axis, weeks before the change are labeled -2 and -1, and weeks after the change are labeled +1 and +2.
Table 2. OLS Regression of Effect of Supervisor Gender on Individual Worker Productivity

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Supervisor</td>
<td>-0.520</td>
<td>2.789***</td>
</tr>
<tr>
<td></td>
<td>(1.139)</td>
<td>(0.767)</td>
</tr>
<tr>
<td>Age</td>
<td>0.064</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.177)</td>
<td></td>
</tr>
<tr>
<td>Low-Skilled</td>
<td></td>
<td>-1.518</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.182)</td>
</tr>
<tr>
<td>Tenure in Factory</td>
<td></td>
<td>0.693</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.543)</td>
</tr>
<tr>
<td>Constant</td>
<td>65.727***</td>
<td>72.171***</td>
</tr>
<tr>
<td></td>
<td>(4.490)</td>
<td>(1.847)</td>
</tr>
<tr>
<td>Worker Fixed Effects</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Month Fixed Effects</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>10923</td>
<td>10923</td>
</tr>
<tr>
<td>R²</td>
<td>0.009</td>
<td>0.285</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.008</td>
<td>0.271</td>
</tr>
</tbody>
</table>

Observations are at the worker-date level.
Standard errors clustered by individual worker are in parentheses.
* p<0.1, ** p<0.05, *** p<0.01
Table 3. Experimental Design

<table>
<thead>
<tr>
<th></th>
<th>Control Sessions</th>
<th>Treatment Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Supervisors</td>
<td>9 (45 workers)</td>
<td>7 (34 workers*)</td>
</tr>
<tr>
<td>Female Supervisors</td>
<td>9 (45 workers)</td>
<td>7 (35 workers)</td>
</tr>
</tbody>
</table>

Each session had 5 randomly picked workers individually performing a task under the management of 1 supervisor. In control sessions, supervisors were allowed to manage workers as they saw fit. In treatment sessions, supervisors were explicitly prevented from participating in the task alongside workers. *One observation is missing in one of the treatment sessions run by a male supervisor because a randomly picked worker could not attend the session on that particular day.

Table 4. Descriptive Statistics for Factory Supervisors in Experiment

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
<th>Difference</th>
<th>p-value of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>30.11</td>
<td>31.14</td>
<td>-1.032</td>
<td>0.577</td>
</tr>
<tr>
<td></td>
<td>(5.561)</td>
<td>(4.504)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction with High School Education</td>
<td>0.833</td>
<td>0.929</td>
<td>-0.095</td>
<td>0.435</td>
</tr>
<tr>
<td></td>
<td>(0.383)</td>
<td>(0.267)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction Married</td>
<td>0.667</td>
<td>0.857</td>
<td>-0.190</td>
<td>0.230</td>
</tr>
<tr>
<td></td>
<td>(0.485)</td>
<td>(0.363)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction from Karnataka state</td>
<td>0.800</td>
<td>0.700</td>
<td>0.100</td>
<td>0.585</td>
</tr>
<tr>
<td></td>
<td>(0.414)</td>
<td>(0.483)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure in Factory (in years)</td>
<td>9.960</td>
<td>7.917</td>
<td>2.043</td>
<td>0.289</td>
</tr>
<tr>
<td></td>
<td>(5.189)</td>
<td>(5.455)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction who have been worker in same factory</td>
<td>0.667</td>
<td>0.500</td>
<td>0.167</td>
<td>0.357</td>
</tr>
<tr>
<td></td>
<td>(0.485)</td>
<td>(0.519)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observations: 18, 14

Mean coefficients; sd in parentheses

*Source: Survey conducted in October-November 2015 for sample of 32 supervisors in experiment; 100% response rate for both female and male supervisors.*
In control sessions, supervisors were allowed to manage workers as they saw fit. In treatment sessions, supervisors were explicitly prevented from participating in the task alongside workers. Bars represent mean individual worker productivity, excluding any supervisor contribution. 90% confidence interval bars are drawn around the mean. Means and standard deviations (in parentheses) reported.
### Table 5. OLS Regression of Effect of Supervisor Gender and Experimental Treatment on Individual Worker Productivity

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Supervisor</td>
<td>135.778**</td>
<td>142.662**</td>
</tr>
<tr>
<td></td>
<td>(67.601)</td>
<td>(68.874)</td>
</tr>
<tr>
<td>Treatment Session</td>
<td>93.284</td>
<td>88.257</td>
</tr>
<tr>
<td></td>
<td>(75.001)</td>
<td>(74.016)</td>
</tr>
<tr>
<td>Female Supervisor * Treatment Session</td>
<td>-194.415**</td>
<td>-214.656**</td>
</tr>
<tr>
<td></td>
<td>(97.012)</td>
<td>(97.668)</td>
</tr>
<tr>
<td>Age</td>
<td>-5.940</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.490)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-5.385</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(10.698)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>104.332*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(59.787)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1773.026***</td>
<td>1912.255***</td>
</tr>
<tr>
<td></td>
<td>(66.802)</td>
<td>(180.022)</td>
</tr>
<tr>
<td>Phase Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>159</td>
<td>159</td>
</tr>
<tr>
<td>R²</td>
<td>0.117</td>
<td>0.137</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.094</td>
<td>0.097</td>
</tr>
</tbody>
</table>

Experiment was conducted in two phases, before and after a major Hindu festival. Observations are at the individual worker level. Robust standard errors are in parentheses.

* p<0.1, ** p<0.05, *** p<0.01
**Table 6. OLS Regression of Effect of Supervisor Gender and Experimental Treatment on Subordinates’ Engagement and Disengagement with their Work**

<table>
<thead>
<tr>
<th></th>
<th>Engagement</th>
<th>Disengagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Supervisor</td>
<td>0.150**</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>Treatment Session</td>
<td>0.063</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Female Supervisor * Treatment Session</td>
<td>-0.207**</td>
<td>0.204***</td>
</tr>
<tr>
<td></td>
<td>(0.100)</td>
<td>(0.076)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.062</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Phase Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>R²</td>
<td>0.040</td>
<td>0.157</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.014</td>
<td>0.134</td>
</tr>
</tbody>
</table>

Experiment was conducted in two phases, before and after a major Hindu festival. Observations are at the individual worker level. We have data for 150 workers rather than the full sample of 159 workers who participated in the experiment because we were unable to video record two experimental sessions. Robust standard errors are in parentheses.

*p<0.1,  ** p<0.05,  *** p<0.01
Figure 3. Supervisor Gender and Managerial Pay Inequality

Source: Daily wage data was obtained for a subsample of 32 supervisors as of February 2015. 90% confidence interval bars are drawn around the mean. Means and standard deviations (in parentheses) reported.

*p<0.1, ** p<0.05, *** p<0.01