Gender Peer Effects in the Workplace: A Field Experiment in Indian Call Centers

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Abstract

Several theories suggest that gender integration in the workplace may have negative effects in gender-segregated societies. This paper presents the results of a randomized controlled trial on the effect of gender integration on work productivity. The study was implemented in call centers located in five Indian cities. A total of 765 employees were randomized to either mixed gender teams (30-50% female peers) or control groups of same gender teams. I find precisely estimated zero effects on both productivity (intensive margin) and share of days worked during the study period (extensive margin) of being assigned to a mixed gender team. However, there is an overall increase in the secondary outcome of peer monitoring and team support for women assigned to mixed gender teams relative to the control team. For male employees, I find that conditional on being assigned to mixed gender teams, men with progressive gender attitudes have higher productivity than men with regressive gender attitude. There is an overall increase in the secondary outcomes of knowledge sharing, dating and comfort with the opposite gender for male employees in mixed gender teams, relative to all male teams.

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1 Introduction

In the last two decades, the female labor force participation rates have been declining in most South Asian countries, including India (ILO, 2017). This is in contradiction to the female labor supply trend observed in the rest of the world during the same period. Additionally, most occupations in South Asian countries (Duraisamy and Duraisamy, 2014) and the world (Goldin, 1994) are gender segregated with women sorting into lower paying and lesser skill intensive jobs than their male counterparts. Removing the barriers to entry in the workplace for women in these developing economies will be crucial in boosting their labor supply (Goldin, 2014, 1994). However, adverse gender norms and gender segregation practices in South Asia may further increase these entry barriers and make firms skeptical of integrating women into the workplace (Chowdhury et al., 2018).[1]

Several theories suggest that gender integration in the workplace may have negative effects in gender segregated societies. For many boys and girls in such traditional societies, the very first prolonged interaction (as equals) with the opposite gender, outside of family members happens in a workplace.[2] Interaction among opposite genders is likely to lead to psychic costs in the workplace in such a setting (Akerlof and Kranton, 2000; Bertrand et al., 2015). This can have a negative impact on a firm's output if it comprises of a gender diverse employee pool, especially of young workers. There can be negative externalities of distraction in such a setting (Hamilton et al., 2012; Mas and Moretti, 2009). On the other hand, gender diversity in the workplace can enhance competition, monitoring and peer pressure among same gender peers if the workers want to impress the opposite gender co-workers (Kandel and Lazear, 1992). The positive impacts can also be driven by knowledge spillovers and mutual learning which can increase worker productivity in diverse groups (Hamilton et al., 2012). Therefore, these competitive pressures could lead to either positive or negative impacts on a worker's performance in mixed gender work environments. These impacts could be especially be negative for work performance of female employees in such competitive settings (Niederle and Vesterlund, 2007).

The paper uses an individual level randomized controlled trial in Indian call centers to study the effect of opposite gender co-workers in the workplace on work performance of employees. I randomize employees in call centers in five cities in India into mixed gender (30% to 50% females) and same gender teams. For male employees, I compare

[1] According to India Human Development Survey (IHDS), a nationally representative household survey, over 58% of married women in India reported to be practicing purdah or seclusion of women from public observation. Around 52% of the respondents in my sample report that their mother or some other female family member practices burkha/purdah.

[2] Even in coeducational schools, peer groups are institutionally determined by gender, by segregation of boys and girls in classrooms. In my sample, around 30% of people at baseline did not interact with the opposite gender outside of their family, while in school. They either didn't attend a co-educational school or if they did, boys and girls in these schools were not allowed to sit together.

the productivity of those assigned to mixed gender to those assigned to all male teams (control group). For female employees, I compare productivity of those assigned to mixed gender teams relative to those in all female teams. The study has a higher number of male employees due to low proportion of female employees in the sample. This is because the female labor force participation rate is low in India so there are fewer women in the workplace relative to men. The randomization increased/intensified opposite gender exposure for male employees in mixed teams and reduced it in the control group relative to the status quo at baseline. A total of 765 employees (297 male employees in mixed gender teams and 320 in all male teams and 67 female employees in mixed gender teams and 81 in all female teams) were seated with their new teams for a median of 12 weeks. Male and female co-workers in mixed gender teams were mapped to sit on alternate seats. The daily level administrative data on productivity, which is internally collected by call centers through automatic technology is used to study worker productivity. So, this paper uses accurate, uniform and consistent measures of productivity for all workers.

A team is an important entity in call centers. In a typical call center, customer support employees or agents are grouped to form teams and agents interact with their team members on a daily basis in team meetings. As it is standard practice in call centers for teams to be seated together, changing the gender composition of teams leads to change in the gender composition of peers seated around a worker. Workers interact with agents sitting next to them if they get stuck on a call and the team leader or manager is not around.[3] This interaction between nearby sitting agents takes place while waiting for calls in the inbound processes. In the outbound processes, the agents typically take out time between calls to talk to agents seated around them.[4] The importance of peer effect in this setting is supported by evidence from the economics literature that low-skilled or routine tasks have significant and larger peer effects than high skill-intensive jobs (Cornelissen et al., 2017; Ichino and Falk, 2005; Bandiera et al., 2010).

The daily level productivity data from both inbound and outbound businesses/processes are aggregated to create a standardized index for productivity. The top three productivity variables are chosen for each of these kinds of processes after discussion and consensus with the call center heads and the managers. After combining these three productivity variables, the aggregate productivity is standardized within each process. The second primary outcome used is share of days worked during the course of the study period.

[3] Humanyze, a Boston based company uses sensors to analyze communication patterns among employees in the workplace in retail, pharmaceutical and finance industries. In an interview with the Wall Street Journal, the company's CEO reveals their finding that immediate neighbors account for 40% to 60% of everyday interactions for a worker, including face-to-face chats and email messages. There is as low as a 5% to 10% of average interaction per day with someone sitting two rows away. (https://www.wsj.com/articles/no-headline-available-1381261423 accessed in October, 2019)

[4] 66% of the respondents in the baseline survey agreed that they learnt something from the agents sitting next to them. When asked about whose help they seek when stuck on a call at the baseline, a vast majority of agents responded that they took help from the team leader (67%) followed by agents seated nearby (27%) and then others (6%).

This is an unconditional measure based on showing up to work so there are no selection concerns.[5]

My main finding is that there is no effect on both productivity (intensive margin) and share of days worked during study period (extensive margin) of being assigned to a mixed gender team. Given that these are precisely estimated effects, these are important findings as they provide supportive evidence for integrating women into the workplace. It does not seem that hiring women will be costly for the firms, as there is no negative impact on productivity or on share of days worked during study period if assigned a seat next to an opposite gender employee. I also explore whether these findings are true for all kinds of workers.

My second finding is that conditional on being assigned to mixed gender teams, women with high autonomy have higher proportion of days worked in the study period than women with low autonomy. Furthermore, women with higher autonomy had a higher proportion of days worked of about 0.08 percentage points when assigned to mixed gender teams. This result provides evidence that there is some peer effect on the extensive margin of productivity for female employees, but only for those with relatively high empowerment and decision making.

My third finding is that conditional on being assigned to mixed gender teams, male employees with regressive gender attitudes have significantly lower productivity than those with progressive gender attitudes. This indicates that interaction with women may be costly for men with regressive gender attitudes. The significant positive impact of gender integration on male employees with progressive gender attitudes on the other hand, is useful evidence supporting gender interactions, especially for policy makers.

My final set of findings explore secondary outcomes using survey response at endline. There is strong evidence of knowledge spillover and learning of 0.3σ (standard deviations) for male employees assigned to mixed gender teams relative to control. The female employees don't exhibit any knowledge spillovers in the treatment. For female employees, there is increase in peer monitoring and comfort for those assigned to mixed gender teams. The female workers in mixed teams received 0.22σ (standard deviations) more peer monitoring and support relative to the control group. This indicates that male employees learn from female agents seated next to them, female employees feel comfortable around these men and are willing to share their knowledge with them. The male employees assigned to mixed gender teams are also significantly (around 16%) more comfortable while receiving feedback infront of opposite gender coworkers in mixed gender teams, than those in all male teams. I fail to find any treatment effects on gender attitude and job satisfaction for both male and female employees.

There is also evidence of an overall increase in dating and socialization by 35% for male employees assigned to mixed gender teams. In India, more than 90% of the marriages

[5] A further assumption of monotonicity is made to avoid selection effects (Lee, 2002).

are arranged by the families (Centre for Monitoring Indian Economy, 2018). There is high prevalence of caste-based segregation and intra-caste marriages, especially among the poor. The increase in dating for men in mixed gender teams in the setting of small town India (Patna, Udaipur and Hubli) is an important finding.

The study contributes to multiple threads of literature. To my knowledge, it is the first individual-level randomized controlled trial to causally interpret the effect of gender diversity of teams on employee performance.[6] It builds on the literature on performance of gender diverse business teams comprising of students. These studies change the gender composition of group homework or project teams in undergraduate or graduate management classes and look at group level outcomes of students (Hoogendoorn et al., 2013; Hansen et al., 2006; Apesteguia et al., 2012). They find that equal or mixed gender teams outperform male-dominated and female-dominated teams. An associated thread in the literature studies gender diversity in boardrooms (Bertrand et al., 2018; Adams and Ferreira, 2009; Ahern and Dittmar, 2012; Matsa and Miller, 2013). Their outcome measures are firm's value/profits and gender earnings gap. Some studies find a favorable change in gender attitudes of males due to gender integration in the workplace in developed country work place settings (Dahl et al., 2018; Finseraas et al., 2016). However, this RCT looks at individual level productivity measures as outcomes. Furthermore, all these papers address this question in a developed country setting. This research question is more relevant in the context of a developing country workplace, where gender is salient. This paper also adds to the thread of experimental studies set in non-work settings in India, which have shown how diversity has been successful in removing inter-group biases (Rao, 2013; Beaman et al., 2009; Lowe, 2018).

Human resource allocation in the workplace such as seating and team alignments, which maximize worker productivity are integral to the workplace and personnel management literature (Kaur et al., 2010). There is a broad literature of experimental studies that test workplace heterogeneity and socialization in the workplace. This paper adds to these studies that test the effect of diversity along ethnicity (Hjort, 2014) and nationality (Lyons, 2017) lines on employee performance. It also contributes to studies testing the impact of social pressure, social incentives and social networks on worker productivity (Ichino and Falk, 2005; Mas and Moretti, 2009; Bandiera et al., 2010; Amodio and Martinez-Carrasco, 2018; Park, 2019).

This study complements the large literature on impact of differential gender composition in classrooms on schooling outcomes of students. They find evidence of gender peer effects on educational outcomes in kindergarten (Whitmore, 2005), elementary school (Hoxby, 2000), middle school (Lee et al., 2014; Lu and Anderson, 2014; Black et al., 2013; Gong et al., 2019), high school (Lavy and Schlosser, 2011; Jackson, 2012) and col-

[6]Randomization of team composition solves the endogeneity and selection problems associated with team formation and also resolves Manski's reflection problem (Manski, 1993)

lege level (Hill, 2017). There are some studies which find no effect of higher proportion of opposite gender in classrooms on male student's test scores or passing rates (Antecol et al., 2016; Booth and Yamamura, 2016).

My findings have broad policy implications for integrating women into the workforce. Even in the context of this study, some of the sample call centers receive financial subsidy from the central government under India BPO Promotion Scheme (IBPS) to open up its branches in smaller cities.[7] The government of India is committed expanding BPOs to smaller cities, with special provisions of incentive in IBPS for hiring women in order to boost female labor force participation. Due to this scheme and the lower minimum wage requirement in smaller towns, there are now many call centers opening up in smaller cities in India. The evidence from this study can further add to the knowledge of the state and firms and promote hiring of women in the smaller towns of India.

2 Call center setting

The field experiment took place in two Indian call center companies: Call-2-Connect India Pvt. Ltd. and Five Splash Infotech Pvt. Ltd. Call2Connect India Pvt. Ltd. has centers in the state of Bihar (Patna), Uttar Pradesh (Noida) and in a metropolitan city in Maharashtra (Mumbai). Five Splash Infotech Pvt. Ltd. has centers in the state of Rajasthan (Udaipur) and Karnataka (Hubli). All these five cities/locations were used in this experiment.

Business Process Outsourcing companies perform certain contractual tasks or responsibilities for other companies in order to help them to run smoothly. They provide both voice and non-voice support to other companies. So, a call center usually has multiple processes/tasks. The call centers in my study are domestic call centers, providing voice support to local customers in different kinds of processes. The voice support processes that they deal with are broadly divided into inbound and outbound processes. The inbound processes provide customer support services to incoming calls. The inbound processes in sample call centers provide help to all kinds of companies such as food delivery, financial technology, beauty retail etc. In outbound processes, calls are made to customers to mostly make sales. In my sample, outbound calls are made during elections by a political party as part of their campaign/advertisement. I have five inbound and five outbound processes in the study.

2.1 Background on call center employees

The entry level BPO employees who make or receive calls are known as agents. Any incoming agents/employees get hired for training on the recommendation of the human

[7] India BPO Promotion Scheme https://ibps.stpi.in/ (last accessed on 23rd September, 2019)

resource team after an interview. As the processes in the study are all dealing with domestic customers, the entry-level worker requires local language spoken skills and some basic computer training for the job. They are then trained usually for 5 to 10 days by the training team, depending on the process requirement. They are taught the call script, the call quality parameters such as courtesy on the phone, how to use the headsets and computer software related to the process. After the training, they are required to take a test to get certified to be an agent for a particular process. If they fail the test, they have to leave. The training period is unpaid in many domestic call centers.

After an agent gets hired, they work 6 days a week with one day of the week as a holiday (chosen by the agent). A regular workday for a full-time working agent involves 8 hours of logged-in time where the agent is active and available to take calls and one hour of break. Each agent is allocated a computer system with the process information software and a headset. In my sample, when an agent came to work (prior to the period of the study), she had to look for a vacant seat in the assigned seating area for her team and then login into the system with her unique identification number and password. The incoming or outgoing calls are flashed on the computers of agents through a computerized call queueing system. The agents cannot miss any calls if they are logged-in and idle. When it is an agent's time for a break, they can log out of the system. Usually the entire team cannot take lunch breaks together, especially in customer support services where a certain number of agents are pre-decided to be logged-in at different times of day. This is based on expected call volume during the day.

In a typical call center, agents work in teams helmed by the team leader/supervisor. Team leaders supervise groups of 20 to 25 agents (team size), and provide those agents with feedback about their performance using real-time information. The members of a given team leader sit together, taking up 2-3 isles, making it easier for team leaders to monitor agent performance and conduct on-floor team meetings. The agents are usually allocated to the team leader but in many cases, the team leaders give their preference of agents from a new batch of newly qualified workers. The team leaders in the chosen centers are mostly male. The job role of the team leader also includes providing emotional support and motivating the agents, incase of rude and difficult customer experience. Assistant managers, also known as the operations manager, supervise the team leaders.

Agents are paid a fixed salary every month and rarely receive additional incentives. In my sample, the agents are paid an approximate salary of $100-150 per month in smaller cities and $150-220 per month in metropolitan cities with a rare scope of earning $15-20 extra per month depending on call volume. Based on performance, agents get eligible to become team leaders after six months of experience and they get a salary hike of anywhere between 30 to 50 % upon promotion.

2.2 Advantages of the call center setting

There are many advantages to choosing call centers to conduct this experiment about the impact of gender composition of team members on employee performance. This industry serves as an ideal setting for this study. First, despite most industries and occupations in India being male dominated (Mondal, 2018) , the call centers or the Business Process Outsourcing (BPO) sector employs large number of female employees at the agent level (entry level jobs involving making calls as customer support representatives) due to their comparative advantage in interpersonal skills (Jensen, 2012). About 50% of the BPO employees are women in Tier-1 cities and about 20% to 40% in Tier-2 cities in India.[8]

Second reason for choosing this setting is that this is an entry level job and employs young people with low prior exposure to opposite gender. The average age of an agent is around 21 years in my sample. Since most employees are hired straight after high school, they have low past exposure to the opposite gender. This is because even in co-educational schools, peer groups are institutionally determined by gender, by segregation of boys and girls in classrooms. In my sample, around 30% of people at baseline did not interact with the opposite gender outside of their family, while in school. They either didn't attend a co-educational school or if they did, boys and girls in these schools were not allowed to sit together. Domestic call center agents are used for this analysis as it is expected that they have relatively lesser exposure to opposite gender compared to English speaking call center agents catering to international clients.

A third reason is that there are productivity measurement advantages in this setting. First, technology-based monitoring allows for consistent and exact measures of productivity. Second, all agents are aware of these top productivity variables and are provided routine feedback on their individual performance on these variables. So, there is no kind of information asymmetry about the productivity parameters, targets and performance for some agents and not for the others. This is important to avoid any systematic bias in effort of some agents due to lack of information. Third, agent's incentive/pay is not tied to her group performance. This helps in getting rid of any productivity measurement concerns arising from free riding problems. Fourth, these productivity variables are important for the call center profitability so the results of this analysis are of interest and are crucial to the successful operational management of these firms.

The final reason is that the features of this workplace resemble other workplace settings across the world. Workers sit in cubicles next to each other and perform individually assessed tasks. So, the results of this study have implications for other work settings beyond this specific industry. In the context of the call center industry setting, it is the largest private sector employer in India, providing jobs to around 3.9 million people (NASSCOM2017). The call centers in my study are located in both metropolitan and

[8]There is tier-wise classification of centers in India based on population into Metropolitan (Tier-1), urban and semi-urban centers center (Tier-2, Tier-3 and tier-4) and rural centers (Tier-5 and Tier-6)

small cities in India. The chosen call center partners had a similar management structure to other call centers in India that were contacted in the course of this study. Some of these call centers also receive a subsidy from the central government (India BPO Promotion Scheme (IBPS)) for opening centers in Tier-2 and additional incentive for hiring female employees. Therefore, the call centers are beginning to spread into small towns to avail this subsidy and to cut costs.

3 Experimental Design

This RCT experimentally alters the gender composition of teams to study gender peer effects in the workplace. This section discusses the selection criteria of the the call centers, randomization design, main outcomes and their data collection, empirical specification and balance tests of randomization. The importance of teams in this setting is also discussed, along with the team bonding exercise which was carried out to increase knowledge spillovers among new teammates.

3.1 Selection of study subjects

Agents from two BPO companies located in total five Indian cities were chosen for the study. The study took place in 9 businesses/processes within these five centers. There were several criteria for selection of these processes.

A challenge of the call center setting is that there is very high attrition - around 10-20% in smaller cities and as high as 30-40% in metropolitan cities. To circumvent this problem, most of the call centers chosen are in small cities (Udaipur, Patna, Noida and Hubli), so they experience lesser attrition. This also made it possible to study diversity impacts on productivity across many states in India. In addition, the employees in small towns are expected to have minimal opposite gender contact outside their family.

Another challenge is that most workplaces in India and these domestic call centers is that they do not employ female employees in the evening shift. This is because labor laws in India prohibit companies to employ women after 7 pm, unless special approval is taken and sufficient security and conveyance is provided to the female employees. To cut costs of arranging transport for female employees, the centers avoid hiring female employees in evening shifts. So, full-time, morning shift agents are used for the analysis.

An important reason for choosing these particular centers was that there was gender diversity in these centers and men and women were working together in the same shifts. This allowed me to construct mixed gender teams. These centers had one or more processes with atleast 60 agents (3 teams). In order to conduct this experiment, construction of three teams (two mixed and one same gender team) was needed, which could be formed with a process size of atleast 60 agents managed by three team leaders. In some ideal

cases, four teams could be formed and the gender composition of the process was almost equal with similar numbers of men and women. The four teams that could be formed were two mixed gender teams, one all-male team and one all-female team.

The processes that met these criteria were chosen to be in the study. Three processes from a call center in Hubli (from the state of Karnataka), two processes from Noida (Uttar Pradesh), two processes from Patna (Bihar), one process from Udaipur (Rajasthan) and one from Mumbai (Maharashtra) were selected. Out of the chosen locations, Mumbai is the most developed and is categorized as a metropolitan and Tier-1 city. Hubli, Noida and Patna are less urbanized and are in the Tier-2 category. Udaipur in the state of Rajasthan is in Tier-3 category. The North Indian states of Bihar, Rajasthan and Uttar Pradesh in my study are known to perform poorly on the gender equality index than the South Indian states of Maharashtra and Karnataka (SDG India Index Baseline report, 2018).[9]

In processes with more than 60% males, two mixed-gender teams and one all male team is constructed (See Figure 2). This is so that the total number of male employees in the two mixed gender teams is approximately equal to the total number of male employees in the same gender team. If the size of the process allowed for the formation of a fourth team, all female teams were constructed (See Figure 1). There is one morning-shift process where there were greater number of female employees than male employees (See Figure 3). In this process, two mixed gender and one all-female teams were formed. There are three all female teams in the sample, with allocation in three different processes. When the study began, the existing agents were aligned into teams for 6 to 14 weeks. The new batches of employees that joined the processes in the course of the study were also randomly assigned into teams.

3.2 Randomization

I use matched pair randomization method based on past productivity data to assign individual agents into teams. Same gender agents belonging to a particular work-shift are matched on their average performance. The average performance is calculated on one of the chosen (by the company) productivity parameters from 3-4 weeks of pre-study administrative data. These matched pairs of male agents are then assigned into either treatment group (mixed gender team) or control group (male team) using random number generator. The female employees are randomized into the various mixed groups using random number generator. The same method of matched pair randomization is

[9]SDG Index developed by the United Nations and Niti Ayog, Government of India, for gender equality included sex ratio at birth, average female to male wage gap, percentage of seats won by women in general elections, percentage of ever married women who experienced intimate partner violence and percentage of women using modern methods of family planning. Bihar, Rajasthan, Delhi and Uttar Pradesh were at the bottom ten and Karnataka and Maharashtra were in the top ten on this index.

followed in centers where female-only teams could be formed. The teams were made to sit for 6 to 14 weeks based on status of the process.[10]

This batch of existing employees that was randomized on past productivity, will be called the old batch. There were new batches of employees that joined during the course of the study and in the absence of information of past productivity, random number generators were used to assign them into teams. The team sizes and gender proportions were maintained during these assignments. One of the processes in Patna was less than a month old process so there was no information on past productivity available when the team alignment took place. This process will also be called a new batch.

The same method of matched pair randomization is followed to assign team leaders into treatment and control teams. The team leaders are first matched on the past performance based on the average performance of the agents working in their team in the pre-study period. One of each of the matched team leaders are assigned randomly to either treatment or control group.

Prior to the study, flexible seating was followed in all the call centers. In the duration of the study, seat was assigned wherever possible. In four inbound processes and one outbound process, fixed seating assignments were followed. The seats were decided using a random number generator. It was ensured that male and female employees in mixed gender teams were assigned alternate seats. There were five outbound processes, where fixed seating assignments could not be followed. However, even with flexible seating followed within teams in these processes, it was ensured that male and female employees in mixed gender teams sat on alternate seats. There was monitoring at the daily-level to check if the seating plan was followed.

3.3 Teams in call centers

Team is an important entity in call centers. Even though it is individual-based work, the industry promotes bonding among team members and encourages interaction among opposite gender employees. This is crucial for mutual learning and potential knowledge spillovers within teams. In the call centers in my sample, the job training involves trainers conducting interactive games among opposite gender trainees. They carry out these interactive games to enhance communication and comfort among opposite gender employees on the work floor. The training teams also deploy various kinds of mixed-gender seating plans in the training rooms for this purpose. However, usually the training period is very short and not sufficient to break the gender barriers.

Once the agent comes to the floor, there are daily team meetings, usually in the morning, in which team members receive feedback from their team leader on their previous

[10]The experiment went on for 12 to 14 weeks in most call centers -8 out of the 10 processes. One of the each process in Patna and Noida was shut down by the contracting company so the study could run for 6 and 9 weeks respectively in these processes.

day's performance. The interaction between nearby sitting agents also takes place while waiting for calls in the inbound processes. In the outbound processes, the agents typically take out time between calls to talk to agents seated around them, since they can't move around on the floor to socialize.

In order to further strengthen the bonding between the newly constructed teams, a knowledge-sharing game was conducted.[11] There are quality auditing teams within call centers which listen to about 10-20% of randomly selected calls and give performance scores to these calls based on a pre-decided metric. With the help of these quality auditors and training teams, three calls recordings were selected - a call with excellent quality score, a call with average score and a call with low score. As part of the study, these three calls recordings were shared on the computer systems of agents using google drives for one full workday. The agent were given a small notebook in which they had to note down the strengths and shortcomings of the call, their suggestions for improvements and any call-related issues they had faced in the past. They were given 5-7 most important process-based quality criteria.[12] Whenever the agents were waiting for calls, they would listen to these call recordings and make notes.

Using a random number generator two members from a team were selected to be 'buddies.' From mixed gender teams, opposite gender employees were chosen to be buddies. Team bonding exercises were played under the supervision of the research team and the quality auditor in the conference room of the call center. Each set of buddies were made to sit across from each other and asked to discuss and share their ideas on the aforementioned points. The objective of the exercise was also to promote work-related conversations.[13]

3.4 Main outcomes and data collection

The primary outcomes studied in this paper are work productivity and share of days worked in the study period and the secondary measures are gender attitude, job satisfaction, knowledge sharing, dating, peer monitoring and support and comfort with the opposite gender. This study relies on various sources of data to study these outcomes: (i) a baseline survey, (ii) administrative data from the firm, (iii) a follow-up survey at the end of the study. The baseline data was collected before the randomization took place through 30-40 minute long online survey of all agents within a process. The agents took

[11] A challenge was that all the team members could not leave the floor together at any given time in the day and the call centers requested that the game be conducted in less than half an hour.

[12] The call recordings and quality parameters were chosen by the managers and quality auditors of each call center. The agents rated the calls on broadly these quality parameters 1) opening and closing salutation/verbiage, 2) listening skills, 3) rapport building with the customer, 4) soft skills such as courtesy and empathy, and 5) product and process knowledge.

[13] The learnings from this exercise about work related issues faced by the agents and the gaps in training were shared with the management. They found it to be helpful in improving their training and operations.

this online survey on their office computer systems in the presence of a member from the survey team on-site. All agents within a team could not take the survey at once so team members took the survey one at a time. The surveys took place usually in late afternoon or evening, as there was lesser call volume during that time of the workday.

Baseline information was collected on family, education and employment background; gender exposure and empowerment questions on past interaction with opposite gender, autonomy and gender attitude, and potential mechanisms of stress, comfort in teams, self-esteem, socialization etc. At the endline, right before the study ended, there was a short 15-20 minute online survey on the secondary outcome measures and the aforementioned potential mechanisms. For processes in the first half of the study timeline, endline data could not be collected for everyone in the sample as most of the agents had left by the end of the study period. This was due to generally high attrition rates in this industry. For the second half of the sample, the agents who had left the study midway were tracked and requested for a survey response. So, the endline data is used only for the six processes in the second half of the study.

For the main outcome of productivity, individual level daily performance data internally collected by the call centers is used. These measures of productivity are collected automatically by the call center's technology-based monitoring system. The main outcome measure will be the aggregate of the top three quantitative measures of agent productivity, typically used by the call center to track performance. The exact measures used depended on whether the agent worked in inbound or outbound processes.

The inbound processes provide customer support services to incoming callers, so their main productivity measures are average call handling time (ACHT), number of calls and net login hours. The firms gain profits if the agents receive a high number of calls, login successfully for at least 8 hours and handle the calls in less amount of time. So, ACHT is signed as negative in the data.

In outbound processes entailing sales calls, the primary productivity variables are total sales made per day, total calls made per day and their ratio of total sales by calls made per day. The firms gain profits if total sales made per day increases and if the ratio of sales by calls also increases per day. So, the firms benefit if an agent has a high sales conversion rate of calls i.e., she achieves daily sales targets by making fewer number of calls. The total number of calls made per day in the outbound processes is therefore signed as a negative.

Each individual productivity measure is standardized (with mean zero and a standard deviation of one) relative to performance of members of the control group in a respective process. These measures are aggregated for each process and then standardized again using control group mean and variance. Thus, the outcome measure of productivity is comparable across processes.

The second main outcome is share of days present in the study period. In the daily

level administrative productivity data, there is information on the productivity of all the logged-in agents on any particular date. This gives information on who was present and absent on each particular day of the study from the day of joining the study. Using this, each agent is marked to be present on the days in the study for which their productivity data is available and for other days, they are marked absent. Hence, share of days worked during study period is calculated as:

$$\textit{Share of days worked during study period} = \frac{\textit{Days present in the study period from joining}}{\textit{Number of days of the study}} \tag{1}$$

The first secondary outcome measure of gender attitude is studied. A broad set of questions are borrowed from the current literature on measuring women's empowerment and gender attitudes (Dhar et al., 2018; Glennerster et al., 2018). The broad topics covered in these questions are education attitude, employment attitude, attitudes on traditional gender roles and fertility attitudes. Each individual worker in the study is surveyed on these questions prior to the start of the study (baseline) and towards the end of the study (endline). A standardized index is formed each at the baseline and endline using control group mean and standard deviation.

Another secondary outcome measure focused in the study is the job satisfaction level of employees. It is collected at an individual level through baseline and endline surveys. To determine job satisfaction, each employee is asked to evaluate her "emotional exhaustion" using a standardized set of questions (Watson et al., 1988). The responses to these questions standardized and are aggregated to form an index, using control group mean and standard deviation.

Knowledge sharing within teams, peer monitoring and support, dating and comfort while receiving feedback infront of opposite gender are other important secondary outcomes studied. The individual employees were surveyed on these outcomes both at baseline and endline. Only for the outcome, comfort while receiving feedback infront of opposite gender, baseline data was not collected. Mid-study qualitative survey of managers about the expected impact of the study highlighted that male employees felt uncomfortable while receiving feedback from the team leaders infront of female employees, especially if the feedback is negative. Therefore, this additional question was asked at the endline. The exact questions asked for these variables is mentioned in the Appendix in the survey questions section.

For all secondary outcomes, individual level survey responses collected at endline for five of the nine processes in the study involving male employees is used for the analysis. The endline data could not be collected for the entire sample for four processes due to attrition during the study period. For the sample of five processes for which endline data could be collected, workers were followed and surveyed even after they quit employment

at the call center in the study duration. For female employees, the endline responses could be obtained for all the entire sample involving three processes.

3.5 Empirical Specification

To measure the average impact of treatment/gender exposure, I use intent-to-treat (ITT) effects by regressing productivity and other outcomes on an indicator for mixed gender team or gender integration treatment. All the outcomes have either multiple time-period data or the same question was asked in both the baseline and follow-up surveys. The main specification is the following ANCOVA specification to obtain β_1:

$$\begin{aligned} \mathrm{Y}_{igst} = \beta_0 + \beta_1 \mathrm{GenderIntegrationTreatment}_{igst} + \beta_2 \mathrm{Y}_{i,PRE} \\ + \omega_s + \upsilon_t + \mathrm{MissingBaselineData}_{igs} + \epsilon_{igst} \end{aligned} \tag{2}$$

Where $\mathrm{Y_{igst}}$ is the given outcome variable measured post-treatment, and 'i' is agent, 'g' is team/group, 's' is strata or the lowest unit of randomization (pair/shift/batch/process) and 't' is date. Gender-Integration-$\mathrm{Treatment_{igst}}$ is an indicator for the individual being assigned to treatment arm. $\mathrm{Y_{i,PRE}}$ is productivity of agent 'i' in strata 's' at baseline. For employees whose baseline productivity data is missing, the control mean value of 0 is assigned to them. Missing Baseline $\mathrm{Data_{igs}}$ is an indicator variable which takes the value 1 if the employee was a new entrant and did not have any baseline productivity information at the time of randomization, and it takes the value 0 if the employee had baseline information. ω_s is strata fixed effect, υ_t is date fixed effect and ϵ_{ist} is the error term. Standard errors are clustered at the team level to account for any correlated shocks to productivity within teams.

This specification is run separately for male and female employees in the study. There are 38 teams/clusters for male agents and 8 clusters for female employees. In cases where an outcome variable was not collected at baseline, these same specifications is estimated without the control for baseline outcome.

3.6 Randomization and Implementation Checks

Balance checks in Tables 1and 2 show that the randomization was successful on baseline productivity and other individual characteristics of the sample. These balance checks are conducted after controlling for strata fixed effects (unit of randomization). The most important variable for balance is baseline productivity and it passes the balance test by failing to reject the null hypothesis that there is no difference between the treatment and control groups. There were some employees who left the call center before the study began. They were included in the initial randomization because the call centers provided

old employee lists or failed to remove the employees who had submitted their resignation prior to the randomization. Therefore, a selective attrition test is also conducted on the remaining sample of male employees after accounting for attrition. Appendix Table 1 shows that the treatment and controls arms were balanced on individual characteristics after removing attriters.

4 Results

This section presents the results of the RCT on primary outcome measures. The evidence on the extensive margins of productivity, share of days worked during the study period is presented. On the intensive margin, impact on daily worker productivity is studied. Heterogeneous effects of treatment is also highlighted in the second subsection followed by the results on secondary outcomes.

4.1 Results on primary outcome measures

For both male and female employees, there is no overall impact of being assigned to gender integration treatment on share of days worked during the study (Table 3). The control mean for male employees is 0.49 or male employees in the control group worked for around 50% of the days of the study. The effect of being assigned to a mixed gender team meant a reduction of proportion of days worked by approximately 1.6% compared to workers in all male teams (Table 3, column 1). The estimate is insignificant and is a precisely estimated result with tight bounds around zero. The standard error is of 0.023 for male employees. The null value lies within 95% confidence interval [CI -0.037 to 0.053] around the point estimate.

The female workers assigned to the control teams worked for a higher proportion of days of about 56% in the study duration, than their male counterparts. The impact of being assigned to mixed gender teams relative to same gender teams for females is approximately 1.4% of lesser share of days worked during the study period (Table 3, column 3). The standard errors for female employees at 0.042 is slightly larger than that for male employees, because the sample size for females is smaller in the study. However, the effect of gender integration treatment on share of days worked during study period for female employees is also not distinguishable from zero [95% CI -0.074 to 0.09].

The overall effect of gender integration treatment on productivity is zero for both male and female employees (Table 3). These effects are precisely estimated with tight bounds around 0 at the 95% confidence interval. The impact of being assigned to mixed gender teams on male productivity is 0.017σ (standard deviations) higher than the control mean (Table 3, column 2). The standard error is 0.049 for male productivity and the null value lies within the 95% confidence interval [CI -0.08 to 0.11].

For female workers, the overall impact of gender integration treatment on daily productivity is -0.08σ (standard deviations) lesser than than the control group (Table 3, column 4). With standard error 0.048, this is an insignificant result with the point estimate falling between the 95% confidence interval [CI -0.13 to 0.17]. These estimates allow me to rule out gender peer effects on productivity that are fairly small.

4.2 Heterogeneous treatment effects on primary outcomes

I test for heterogeneity along baseline measures of low prior exposure to opposite gender and regressive gender attitude for male employees on the primary outcomes of productivity and share of days worked during study period. An additional characteristic of autonomy or decision making power for female employees is tested (Tables 4 and 5). The survey responses on each of these characteristics are averaged for every respondent (See Appendix section on survey questions) and then the median value of all the responses based on gender is taken as cutoff to categorize same gender workers as high or low in that particular characteristic. I do not find evidence for heterogeneity along these characteristics on share of days worked during study period for male employees (Table 4, columns 1 and 2).

I find that conditional on being assigned to mixed gender teams, women with high autonomy have significantly higher share of days worked in the study than women with low autonomy (Table 4, column 5). Women with higher autonomy had a significantly higher proportion of days worked of about 0.08 percentage points when assigned to mixed gender teams relative to the control group mean of 0.56 for all female teams. So, the women with high baseline autonomy showed up to work approximately 14% more than those assigned to control. For other characteristics for females, there is no evidence for heterogeneity on this outcome measure (Table 4, columns 3 and 4). These results suggest that there are no gender peer effects on the share of days worked during study period for workers with low or high past exposure to opposite gender and workers with regressive or progressive gender attitude.

While testing for heterogeneous treatment effect on daily level employee productivity, I find that conditional of being assigned to treatment male employees with regressive gender attitude have significantly lower productivity than those with progressive gender attitude (Table 5, column 2). So, males with regressive gender attitudes show up to work for the same proportion of days as men with regressive gender attitudes but have lower daily productivity. I do not find any evidence for heterogeneity along past exposure to opposite gender on productivity outcome, for either male or female employees (Table 5, columns 1 and 3). For female employees there is no evidence on characteristics of attitude and autonomy (Table 5, columns 4 and 5). This indicates that there is an overall zero treatment effect on female productivity along the distribution of these individual charac-

teristics of opposite gender exposure, gender attitude and autonomy/ empowerment.

4.3 Results on secondary outcome measures

I explore secondary outcomes using survey response at endline for male employees and find strong positive impacts on knowledge sharing, dating and comfort with opposite gender (Table 6).[14] There is a 0.3σ (standard deviations) increase in knowledge sharing, which measures if the employee benefitted from agents sitting nearby on work related issues (Table 6, column 3). This is a large treatment effect which provides evidence of knowledge spillover and learning for male employees assigned to mixed gender teams. This result is significant at the 5% level. It indicates that male employees learn from female agents seated next to them.

There is an increase of 19 percentage points in dating for male employees in treatment teams, higher than the mean dating of 0.54 in the all male teams (Table 6, column 4). So, there was an increase of 35% in dating for male employees assigned to mixed gender teams compared to the 54% dating in the control teams. This result is significant at the 5% level. However, the reporting is lower for this question as it was the last question of the survey. A pre-intervention balance check was done on individual characteristics for men who responded to the dating question and those who didn't and the two groups were found to be similar.

I also find a 0.05σ (standard deviations) increase in comfort while receiving feedback infront of opposite gender employees for male employees, relative to the control group mean of 0.32 (Table 6, column 6). This result is significant at the 5% level. The male employees in mixed gender team were approximately 16% more comfortable with the opposite gender than those in all male teams by the end of the study period.

For gender attitude of male employees, there is no evidence of any treatment affect. There is a -0.19σ (standard deviations) decline in the gender attitude of male employees assigned to mixed gender teams relative to the control group (Table 6, column 1). The estimate is insignificant with a standard error of 0.2. It has bounds around zero at the 95% confidence interval [CI -0.58 to 0.19]. For other secondary outcome measures of job satisfaction level and peer monitoring and support, I find similar precisely estimated effects bounding zero. The treatment effect for job satisfaction is a small decrease of -0.01σ (standard deviations) relative to the control group. This result is insignificant and has a standard error of 0.17 [CI -0.18 to 0.16]. The treatment effect for peer monitoring and support is 0.05σ (standard deviations) relative to the control group. This result is not significant and has a standard error of 0.17 [CI -0.28 to 0.38].

For female employees, there is increase in peer monitoring and team comfort for those

[14]For male employees, the endline data is not available for the entire sample but for five of the nine processes. The result for these processes for which endline data is available is similar to the overall results for main outcomes discussed in the previous sections (see Appendix table 2).

assigned to mixed gender teams (Table 7, column 5). The female workers in mixed teams received 0.22σ (standard deviations) more peer monitoring and support relative to the control group. This result is significant at the 1% level. So, even though female workers don't have a treatment effect on knowledge spillovers from their teammates or comfort while receiving feedback from opposite gender, they seem to be receiving a lot of support from their male peers if assigned to a mixed gender team. The results on knowledge sharing and comfort with opposite gender are precisely estimated with bounds around zero. There is a decline of 0.11σ (standard deviations) compared to the control group mean on knowledge sharing (Table 7, column 3). This is not significant and with a standard error of 0.14, the point estimate lies within a 95% confidence interval [CI -0.39, 0.17] which bounds zero.

Higher number of female employees reported to be comfortable with the opposite gender (55%) compared to 32% of male employees in the control groups. Female employees belonging to the same gender teams also have a higher incidence of dating than male employees from all male teams by 8 percentage points. I find that the treatment effect of being assigned to a mixed gender team on comfort with opposite gender while receiving feedback is 0.06σ (standard deviations) higher than the control (Table 7, column 6). With a standard error of 0.13, the result is not significant and the point estimate lies within the confidence interval bounding zero [-0.2 to 0.19].

The overall impact of treatment on dating among female employees is quite low at 0.1 percentage point or 1.6%. This is a precisely estimated zero effect with a standard error of 0.16 falling within the 95% confidence interval [CI -0.31 to 0.32] around the point estimate (Table 7, column 4). I find a large but insignificant impact of treatment on both gender attitude and job satisfaction levels of female employees. The effect of treatment on being assigned to mixed gender teams is 0.25σ (standard deviations) higher than the control group with a standard error of 0.14 [95% CI 0.02 to 0.5] (Table 7, column 1). The gender integration treatment effect on job satisfaction level is 0.27σ (standard deviations) higher than the control with a standard error of 0.17 [95% CI 0.02 -0.06 to 0.6] (Table 7, column 2).

5 Discussion and Conclusion

This study provides an experimental test of productivity impacts for employees with mixed gender composition of peers in the workplace, against employees with same gender peers. Competing forces of knowledge spillovers, dating and socialization, comfort and peer monitoring are also studied. I find a precisely estimated overall zero effect on daily productivity and share of days worked during study period for both males and females assigned to mixed gender teams relative to control groups of same gender teams.

Research on productivity improvements in the high growth sector BPO industry is

crucial for sustainable job creation for many young workers, particularly women. Due to growth and increases in employment opportunities, women who were previously doing unpaid care work or informal work, are entering the formal labor market in regions like Patna and Udaipur. These call centers also attract young workers from nearby villages and small towns. The policy makers in India are interested in expanding this sector to more of these smaller cities and even villages. Under the IBPS scheme, the government gives incentives to firms to open up branches in these smaller places and also provides additional incentive to call centers to hire female employees to boost their labor supply. The paper provides supportive evidence to strengthen the objective of the policy makers. It also informs firms skeptical of integrating women into the workplace that integration of women into the workplace is not costly, as gender diversity and interactions in the workplace do not impact the productivity of a worker negatively.

Even though this study has implications on all kinds of gender diverse workplaces, there might be more positive effects on the intensive margin of productivity in places with lesser gender discrimination and progressive gender attitudes for male employees. Similarly, the treatment effects on extensive margins of share of days worked during study period may be higher for women with higher autonomy. Increases in knowledge sharing, peer monitoring and comfort of receiving feedback infront of opposite gender in mixed gender teams is evidence that there is higher knowledge spillovers in gender integrated settings. Therefore, the firms may benefit from policies of gender-integrated seating, such as the one practiced in the study in mixed gender teams with alternate seating of opposite gender employees in increasing knowledge spillovers and learning for male employees and peer monitoring and comfort for female employees. This may prove a low cost way of increasing learning among coworkers in firms.

In India, more than 90% of the marriages are arranged by the families (Centre for Monitoring Indian Economy, 2018). There is high prevalence of caste-based segregation and intra-caste marriages especially among the poor. The increase in dating for men in mixed gender teams in the setting of mostly small town India, is an interesting finding.

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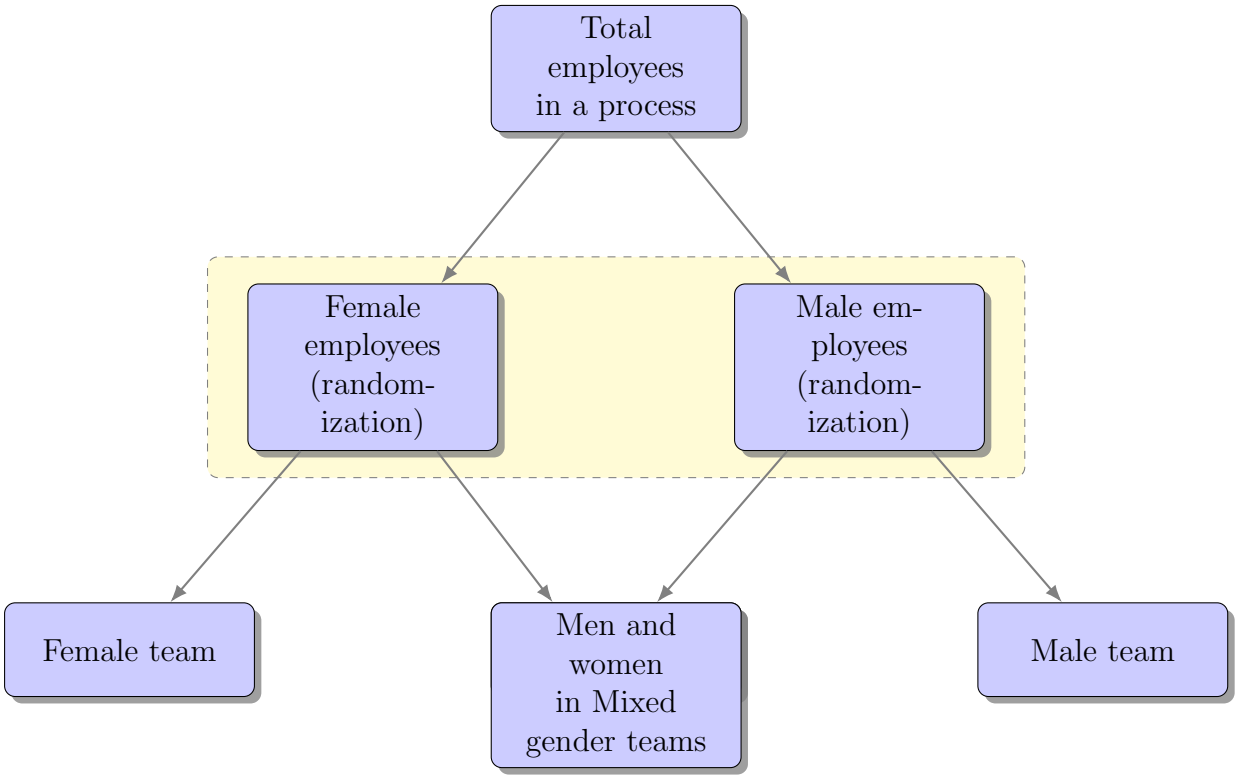
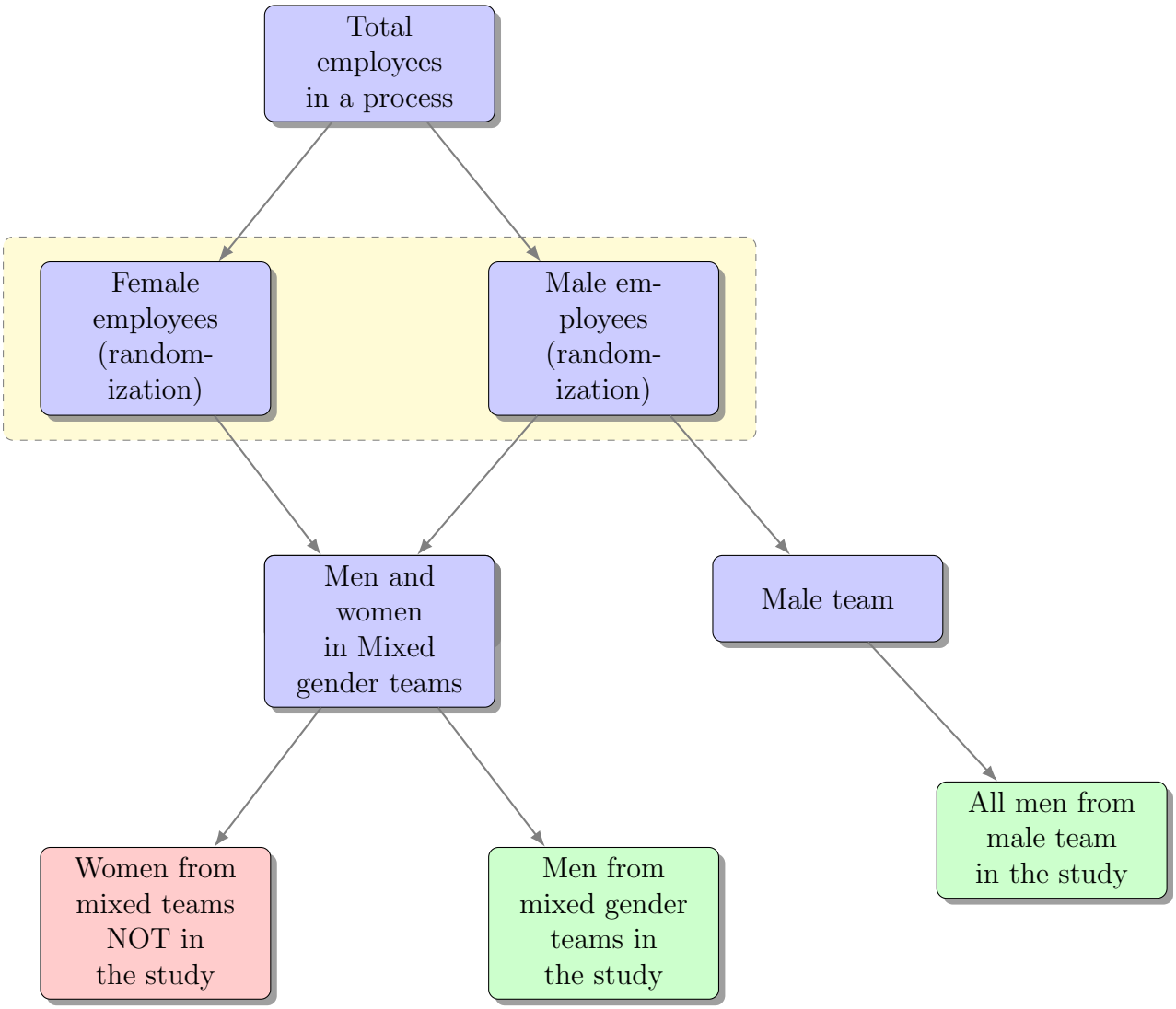
Figure 1: Randomization design



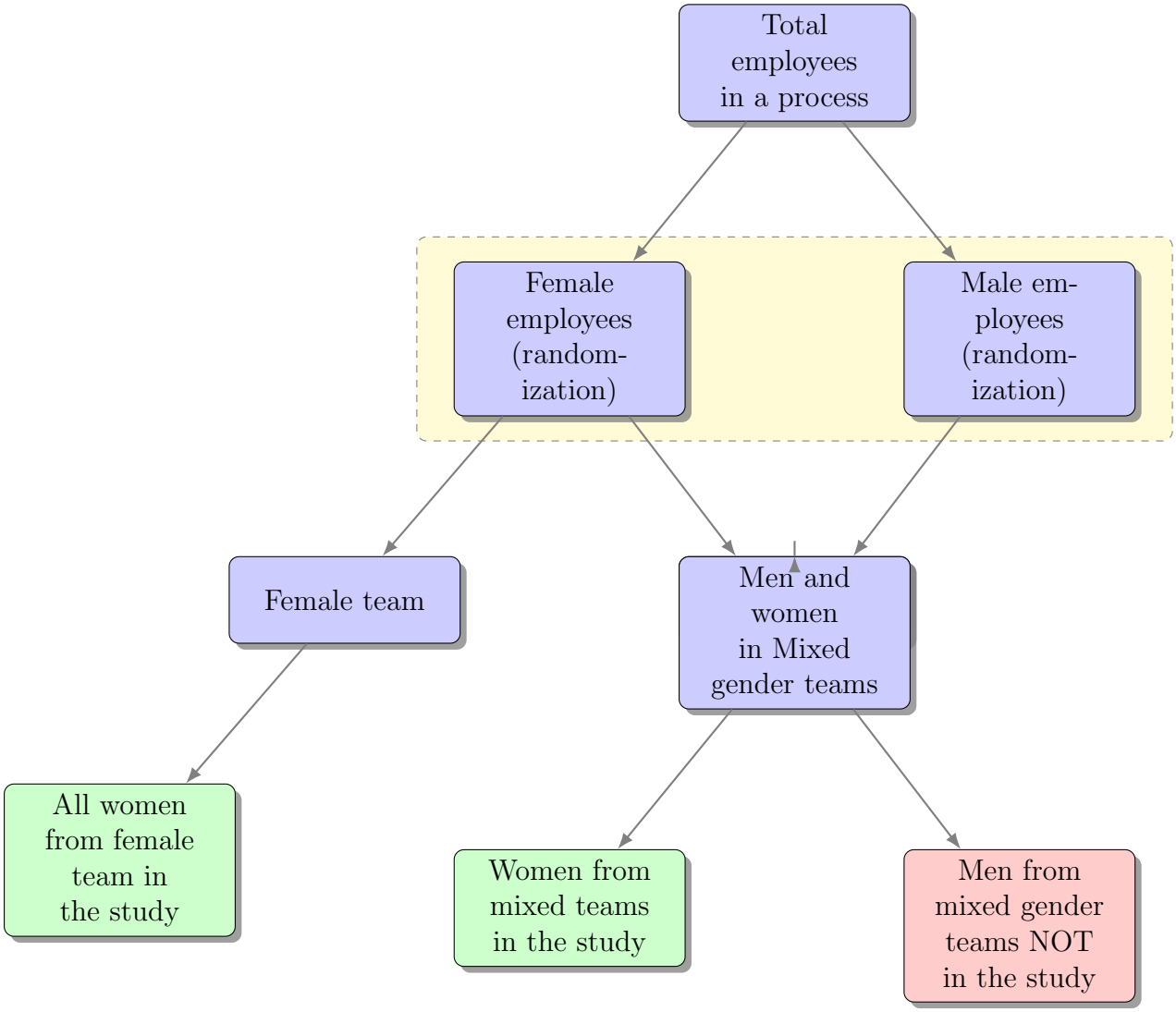
Notes: This is the case for 2 processes in the study. There were approximately equal number of men and women and 4 team leaders to lead the teams. Two mixed gender teams, one all-female and one all-male teams were formed.

Figure 2: Randomization design for some cases



Notes: This is the case for 7 processes. There were fewer women so female-only teams couldn't be formed.

Figure 3: Randomization design for one case



Notes: This is the case for 1 morning shift process in Udaipur. There were fewer men so male-only teams couldn't be formed.

Table 1: Pre-intervention balance on individual characteristics

	Male agents			Female agents		
	Mixed team mean/sd	All male team mean/sd	p-value of difference	Mixed team mean/sd	All female team mean/sd	p-value of difference
Age (in years)	21.63	21.77	0.54	22.16	22.36	0.73
	(2.79)	(3.23)		(2.74)	(3.95)	
Education (in years)	13.88	13.66	0.04	14.25	14.16	0.71
	(1.27)	(1.33)		(1.33)	(1.32)	
Attended government school	0.46	0.44	0.69	0.27	0.34	0.35
	(0.50)	(0.50)		(0.48)	(0.45)	
Urban (home place)	0.68	0.69	0.8	0.84	0.81	0.65
	(0.47)	(0.46)		(0.37)	(0.40)	
Experience at the call center (in months)	2.61	2.62	0.98	4.06	2.46	0.27
	(4.76)	(4.61)		(4.55)	(2.67)	
Super index of exposure	0.52	0.51	0.93	0.32	0.27	0.10
	(0.27)	(0.28)		(0.23)	(0.20)	
Past exposure to opposite gender (index)	0.69	0.69	0.86	0.75	0.74	0.6
	(0.18)	(0.18)		(0.15)	(0.16)	
Autonomy (index)	0.73	0.75	0.28	0.74	0.79	0.07
	(0.20)	(0.19)		(0.16)	(0.16)	
Gender attitude (index)	0.57	0.58	0.45	0.51	0.55	0.11
	(0.18)	(0.18)		(0.15)	(0.14)	
Job-satisfaction (index)	2.20	2.34	0.06	2.32	2.55	0.37
	(0.94)	(0.93)		(0.99)	(0.92)	
Number of observations	297	320	617	67	81	148

Notes: This includes the survey responses from male and female agents at the baseline or in the pre-intervention period. For indices such as job satisfaction index, gender attitude index etc., the average response of all the attempted questions for the particular index is calculated. Super index on exposure includes responses for gender attitude, past exposure to opposite gender and average autonomy of females in that process, new batch along with being in north or south Indian process.

Table 2: Balance check on baseline productivity

	(1) *Male Baseline Productivity (zscore)*	(2) *Female Baseline Productivity (zscore)*
Gender integration treatment	.047	-0.11
	(0.09)	(0.13)
Observations	494	91
Control Mean	0	0
Control SD	0.99	0.99
Strata FE	Yes	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1 This includes the sample of men and sample of women in the study who were randomized at the beginning of the study into the mixed gender (treatment) and same gender teams (control). Out of 617 men, 494 and out of 148 women, 91 of them were from old batches and had past productivity data. They were randomized using the past productivity data at the beginning of the study. The average is taken of the three top productivity variable zscores to get the baseline productivity zscore. Strata fixed effect is included. Standard errors are clustered at the team level.

Table 3: Overall impact of gender integration treatment on primary outcomes

	Male agents		Female agents	
	Share of days worked during study period	*Productivity (zscore)*	*Share of days worked during study period*	*Productivity (zscore)*
Gender integration treatment	-0.008	0.017	-0.008	-0.081
	(0.023)	(0.049)	(0.042)	(0.048)
Observations	43,695	20,575	12,227	6,384
Mean	0.49	0	0.56	0
Control SD	0.49	0.98	0.49	0.99
p-value (CGM)	0.76	0.79	0.94	0.33
Date FE	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes
Baseline productivity	No	Yes	No	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. This includes the sample of males and females in the study who were randomized into the mixed gender (treatment) and all male teams (control) and all female teams (control) in inbound and outbound processes. The primary important productivity variable is the sales and survey made per day in outbound processes and average call handling time in Inbound processes. The secondary productivity variable is ratio of number of surveys by number of calls made in a day in outbound processes and net login hour in Inbound processes. The third productivity variable is the number of calls made per day. All performance measures are z-scores (constructed by taking the average of normalized performance measures, where these are normalizing each individual measure to a mean of 0 and standard deviation of 1). The average is taken of the three productivity variable zscores to get the productivity zscore. The workers were paired up before randomization into treatment and control groups. The regressions are run at the daily level, with strata fixed effects and baseline productivity as a control. Days worked during study period is an indicator variable for whether an employee was present or absent on a date. Standard errors are clustered at the team level, while the p-value reported in the table comes from clustering at the team level using Cameron, Gelbach and Miller's wild-cluster bootstrap.

Table 4: Heterogeneous treatment effects on share of days worked during study period

	Male agents		Female agents		
	Low prior exposure	*Regressive gender attitude*	*Low prior exposure*	*Regressive gender attitude*	*Low female autonomy*
Gender integration treatment	-0.003	-0.000	-0.055	-0.014	0.084**
	(0.038)	(0.023)	(0.053)	(0.056)	(0.033)
Treatment*Interaction variable	-0.009	-0.016	0.102	0.010	-0.208***
	(0.047)	(0.046)	(0.078)	(0.080)	(0.040)
Interaction variable	0.004	-0.015	0.029	0.042	-0.144***
	(0.029)	(0.033)	(0.047)	(0.047)	(0.029)
Observations	43,695	43,695	12,227	12,227	12,227
Control Mean	0.494	0.494	0.561	0.561	0.561
Control SD	0.49	0.49	0.49	0.49	0.49
p-value (CGM): Treatment	0.95	0.98	0.47	0.86	0.23
p-value (CGM): Treatment*Interaction	0.87	0.74	0.23	0.90	0.04
p-value (CGM): Interaction	0.89	0.67	0.58	0.45	0.39
Date FE	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes
Baseline productivity	No	No	No	No	No

Notes: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. This includes the sample of males and females in the study who were randomized into the mixed gender (treatment) and same gender teams (control) in Inbound and Outbound processes. Share of days worked during study period is an indicator variable for whether an employee was present or absent on any particular date within the study period from the day of entering the study. The regressions run at the daily level so controlled for date and strata fixed effects. Standard errors are clustered at the team level, while the p-value reported in the table comes from clustering at the team level using Cameron, Gelbach and Miller's wild-cluster bootstrap.

Table 5: Heterogeneous treatment effects on productivity

	Male agents		Female agents		
	Low prior exposure	*Regressive gender attitude*	*Low prior exposure*	*Regressive gender attitude*	*Low female autonomy*
Gender integration treatment	-0.023	0.105	-0.030	-0.062	-0.012
	(0.074)	(0.069)	(0.128)	(0.080)	(0.087)
Treatment*Interaction variable	0.079	-0.192**	-0.114	-0.053	-0.128
	(0.096)	(0.088)	(0.236)	(0.239)	(0.090)
Interaction variable	-0.114*	0.058	-0.011	-0.101	-0.706***
	(0.065)	(0.062)	(0.210)	(0.123)	(0.149)
Observations	20,575	20,575	6,384	6,384	6,384
Control Mean	0	0	0	0	0
Control SD	0.98	0.98	0.99	0.99	0.99
p-value (CGM): Treatment	0.81	0.19	0.86	0.6	0.89
p-value (CGM): Treatment*Interaction	0.42	0.05	0.63	0.82	0.34
p-value (CGM): Interaction	0.11	0.32	0.91	0.46	0.58
Date FE	Yes	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes	Yes
Baseline productivity	Yes	Yes	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. This includes the sample of males and females in the study who were randomized into the mixed gender (treatment) and same gender teams (control) in Inbound and Outbound processes. The primary important productivity variable is the sales and survey made per day in Outbound processes and Average call handling time in Inbound processes. The secondary productivity variable is ratio of number of surveys by number of calls made in a day in Outbound processes and net login hour in Inbound processes. The third productivity variable is the number of calls made per day. All performance measures are z-scores (constructed by taking the average of normalized performance measures, where these are normalizing each individual measure to a mean of 0 and standard deviation of 1). The average is taken of the three productivity variable zscores to get the productivity zscore. The workers were paired up before randomization into treatment and control groups. The regressions are run at the daily level, with strata fixed effects and baseline productivity as a control. Standard errors are clustered at the team level, while the p-value reported in the table comes from clustering at the team level using Cameron, Gelbach and Miller's wild-cluster bootstrap.

Table 6: Overall impact of gender integration treatment on secondary outcomes for males

	Gender attitude index (zscore)	*Job satisfaction index (zscore)*	*Knowledge sharing index (zscore)*	*Dating*	*Peer monitoring and support index (zscore)*	*Comfort with opposite gender*
Gender integration treatment	-0.19	-0.01	0.31**	0.19**	0.05	0.05**
	(0.20)	(0.17)	(0.14)	(0.06)	(0.17)	(0.02)
Observations	327	327	327	234	327	327
Control Mean	0	0	0	0.54	0	0.32
Control SD	0.99	0.49	0.99	0.5	0.99	0.99
p-value (CGM)	0.42	0.97	0.04	0.02	0.77	0.03
Date FE	No	No	No	No	No	No
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Baseline control	Yes	Yes	Yes	Yes	Yes	No

Notes: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. This includes the sample of males in the study who were randomized into the mixed gender (treatment) and all male teams (control) for which endline data was collected for the entire process. The knowledge sharing index is calculated using the average of two survey responses on whether the person sitting nearby affects the employee's productivity and whether the employee talked to agents sitting nearby about how to improve work for more than 5 minutes daily on average. Peer monitoring and support index includes survey responses on questions on comfort and monitoring in the team and support of team members. Dating is an indicator variable that uses survey response on whether the employees are currently dating someone (but not married). Comfort with opposite gender is an indicator variable on survey response on whether the employees are comfortable receiving feedback infront of opposite gender. The average is taken of the survey responses on questions on gender attitude to form an index. A progressive answer was coded as 1 and regressive answer was coded as 0. Job satisfaction is an index of survey response on three questions on emotional exhaustion during work life. These indices were normalized using control group mean and standard deviations within processes to form z-scores. The workers were paired up before randomization into treatment and control groups. The regressions are run at individual level for the processes for which endline is available, with strata fixed effects and baseline control. Standard errors are clustered at the team level, while the p-value reported in the table comes from clustering at the team level using Cameron, Gelbach and Miller's wild-cluster bootstrap.

Table 7: Overall impact of gender integration treatment on secondary outcomes for females

	Gender attitude index (zscore)	*Job satisfaction index (zscore)*	*Knowledge sharing index (zscore)*	*Dating*	*Peer monitoring and support index (zscore)*	*Comfort with opposite gender*
Gender integration treatment	0.25	0.27	-0.11	0.01	0.22***	0.06
	(0.14)	(0.17)	(0.14)	(0.16)	(0.04)	(0.13)
Observations	146	146	146	92	146	146
Control Mean	0	0	0	0.62	0	0.55
Control SD	0.99	0.49	0.99	0.5	0.99	0.99
p-value (CGM)	0.18	0.22	0.5	0.95	0.00	0.82
Date FE	No	No	No	No	No	No
Strata FE	Yes	Yes	Yes	Yes	Yes	Yes
Baseline control	Yes	Yes	Yes	Yes	Yes	No

Notes: *** p<0.01, ** p<0.05, * p<0.1 Standard errors are in parentheses. This includes the sample of all females in the study who were randomized into the mixed gender (treatment) and all female teams (control). The knowledge sharing index is calculated using the average of two survey responses on whether the person sitting nearby affects the employee's productivity and whether the employee talked to agents sitting nearby about how to improve work for more than 5 minutes daily on average. Peer monitoring and support index includes survey responses on questions on comfort and monitoring in the team and support of team members. Dating is an indicator variable that uses survey response on whether the employees are currently dating someone (but not married). Comfort with opposite gender is an indicator variable on survey response on whether the employees are comfortable receiving feedback infront of opposite gender. The average is taken of the survey responses on questions on gender attitude to form an index. A progressive answer was coded as 1 and regressive answer was coded as 0. Job satisfaction is an index of survey response on three questions on emotional exhaustion during work life. These indices were normalized using control group mean and standard deviations within processes to form z-scores. The workers were paired up before randomization into treatment and control groups. The regressions are run at individual level for the processes for which endline is available, with strata fixed effects and baseline control. Standard errors are clustered at the team level, while the p-value reported in the table comes from clustering at the team level using Cameron, Gelbach and Miller's wild-cluster bootstrap.

6 Appendix

Table 1: Selective attrition balance check on individual characteristics

	(1) Mixed team mean/sd	(2) All male team mean/sd	(3) t-statistic of difference
Age (in years)	21.88	21.74	-0.53
	(2.95)	(3.10)	
Education (in years)	13.88	13.63	-2.25
	(1.30)	(1.31)	
Attended government school	0.44	0.48	0.90
	(0.50)	(0.50)	
Urban (home place)	0.65	0.65	-0.07
	(0.48)	(0.48)	
Agent's work experience (number of months)	2.27	2.98	1.19
	(4.01)	(5.22)	
Ever been unemployed	0.40	0.45	1.07
	(0.49)	(0.50)	
Past exposure to opposite gender (index)	0.69	0.70	0.50
	0.19	0.18	
Autonomy (index)	0.73	0.75	0.90
	(0.20)	(0.19)	
Gender attitude (index)	0.57	0.57	0.13
	(0.19)	(0.18)	
Peer pressure (index)	3.12	3.16	0.43
	(1.05)	(1.05)	
Stress level (index)	1.94	2.03	1.02
	(1.05)	(0.97)	
Self-esteem (index)	(0.37)	(0.36)	-0.21
	(0.28)	(0.30)	
Job-satisfaction (index)	2.23	2.34	1.37
	(0.97)	(0.92)	
Observations	252	290	542

Notes: This includes the survey responses from male agents at the baseline or in the pre-intervention period. For indices such as job satisfaction index, gender attitude index etc., the average response of all the attempted questions for the particular index is calculated.

Table 2: Effect of gender integration on primary outcomes for processes with endline data

	Male agents		Female agents	
	Share of days worked during study period	*Productivity (zscore)*	*Share of days worked during study period*	*Productivity (zscore)*
Gender integration treatment	0.003	-0.030	-0.008	-0.081
	(0.019)	(0.073)	(0.042)	(0.048)
Observations	35,058	12,409	12,227	6,384
Mean	0.36	0	0.56	0
Control SD	0.48	0.97	0.49	0.97
Date FE	Yes	Yes	Yes	Yes
Strata FE	Yes	Yes	Yes	Yes
Baseline productivity	No	Yes	No	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1 This includes the sample of males and females in the study who were randomized into the mixed gender (treatment) and all male teams (control) and all female teams (control) in Inbound and Outbound processes for processes with full endline data available. For males, endline data is available for 5 out of the 9 processes. For female endline data is available for all 3 processes. The primary important productivity variable is the sales and survey made per day in Outbound processes and Average call handling time in Inbound processes. The secondary productivity variable is ratio of number of surveys by number of calls made in a day in Outbound processes and net login hour in Inbound processes. The third productivity variable is the number of calls made per day. All performance measures are z-scores (constructed by taking the average of normalized performance measures, where these are normalizing each individual measure to a mean of 0 and standard deviation of 1). The average is taken of the three productivity variable zscores to get the productivity zscore. The workers were paired up before randomization into treatment and control groups. The regressions are run at the daily level, with strata fixed effects and baseline productivity as a control. Days worked during study period is an indicator variable for whether an employee was present or absent on a date. Standard errors are clustered at the team level.

Survey Questions

Past exposure to opposite gender index : It constitutes of answers from the following Agree/Disagree questions
1) Did you go to a co-educational school?
2) If co-ed, did boys and girls sit together?
3) Do you have opposite gender siblings?
4) Did you grow up in a joint family with any opposite gender cousins?
5) Did you have a female teacher in school?
6) Did you have any friends from your neighborhood who were from the opposite gender?
7) Have you ever been in a relationship?
8) Have you ever had a team leader of opposite gender?
9) Does your mother or female family members practice ghoonghat/burqa?
10) Do you have lunch with opposite gender?

Job Satisfaction index – rank on a scale of 1 to 5
1) I feel used up at the end of the work day
2) I dread getting up in the morning and having to face another day on the job.
3) I feel I am working too hard on my job.

Gender attitudes index- The response for each of the following questions was aggregated to form an index of gender attitude. Each response was coded as 1 if the respondent answered "Strongly Agree" or "Agree" with a gender-progressive statement or "Strongly Disagree" or "Disagree" with a gender-regressive statement, and 0 otherwise. The following questions are based on gender attitude questions in Dhar et al., 2018, Glennerster et al. (2018) and some new questions specific to the setting, designed by the author.

Express if you agree or disagree with the following statements:

Education attitudes
1) Wives should be less educated than their husbands
2) I want my spouse to be more educated than me
3) Boys should be allowed to get more opportunities and resources for education than girls
I. Employment attitudes
1) I wouldn't let my sister work in a call center as it is not a suitable job for women from good families.
2) I want my spouse/partner to earn more than me
3) A woman's most important role is to take care of her home, feeding kids and cook for her family
4) Men are better suited than women to work outside of the house
5) Marriage is more important for a woman than her job

7) Men are the best at leading at the highest level
8) Men should take care of the house if they earn less
9) I will not allow my sister to have a boyfriend before marriage

II. Women's role attitudes

1) Nowadays men should participate in child rearing and household chores rather than leaving it all to the women.
2) Brothers should monitor their sister's friends and her phone as it is their responsibility
3) Sisters should monitor their brother's friends and his phone as it is their responsibility
4) Daughters should have a similar right to inherited property as sons
5) Women should dress up according to what her husband or family allows for the sake of her family honor
6) A man should have the final word about decisions in his home
7) A woman should tolerate violence in order to keep her family together
8) Parents should maintain stricter control over their daughters than their sons
9) A shy demeanour makes a girl a more suitable bride
10) A woman has to have a husband or sons or some other male kinsman to protect her.
11) I won't allow my sister to go to college if it is in the city far away from home
12) Having a son is important to me because it will make my parents and in-laws satisfied.

III. Fertility attitudes – marked as gender regressive if answers to the first fertility question is A and if the reply is answer C in question 1 and but answer B in question 2.
1) Suppose the first two children born to a husband and wife are both girls. Which of the following should they do?
(A) have more children till they have a boy child
(B) no more children, as this is the perfect family size
(C) have one more child but no more
2) Suppose the first two children born to a husband and wife are both boys. Which of the following should they do?
(A) have more children
(B) no more children
(C) have one more child but no more

Peer monitoring and support
1) Do your teammates monitor your work?
2) Do you feel that your teammates are interested in your performance?
3) Do your teammates offer suggestions for performance improvement?
4) Do you feel comfortable in the workplace?
5) Do you feel comfortable with your teammates?

Autonomy

Index of number of decisions that individual is the most important decision-maker for (they answer respondent is most important) among following decisions:

1)Clothes for yourself

2) Whether you work outside the home

3) How money earned by you is spent

4) Time you spend socializing outside the house

5) What education/training pursuits you follow

6) Selection of a spouse for you

7) With whom do you travel to work