

Selection and Sorting when Supervisors have Discretion: Experimental Evidence from a Tanzanian Factory*

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Abstract

Almost all firms rely on supervisors to select and motivate workers. But what are the benefits and costs of doing so? In partnership with a large garment manufacturing firm in Tanzania, we implement a series of field experiments to examine supervisor discretion in the selection of workers for promotion to managerial positions. In a first field experiment, we randomize whether supervisors face financial incentives based on the quality of the workers they refer for promotion. In a complementary experiment with workers, we randomly vary whether supervisor referrals are emphasized in the selection process when workers make application decisions. Our results show that discretion crowds in supervisors' private information about the managerial quality of workers. However, discretion also generates costs for firms. Supervisor referrals are not perfectly aligned with the firm's objectives and discretion is disliked by workers and reduces the likelihood that workers apply for promotion. A counterfactual analysis reveals that, despite the costs of discretion, supervisors select workers with significantly higher measured managerial ability relative to more objective selection methods. Thus, while discretion reduces the number of workers who pursue promotion opportunities, because worker self-selection and work performance are orthogonal to managerial quality, on net discretion leads to the promotion of higher quality workers.

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1 Introduction

Firms vary widely in their productivity, both when comparing across firms, and across teams within the same firm. Increasingly, empirical evidence suggests that individual managers matter in explaining some of this variation (Bertrand and Schoar, 2003; Bandiera, Barankay, and Rasul, 2007; Lazear, Shaw, and Stanton, 2015; Frederiksen, Kahn, and Lange, 2020; Hoffman and Tadelis, 2020; Adhvaryu, Nyshadham, and Tamayo, 2023). But how can firms find good managers? The fact that there is such large dispersion in observed managerial quality attests to the difficulty of solving this problem. This issue is also particularly important in developing countries with relatively low human capital, where a “missing middle” in management is often cited as a key barrier to firm growth.¹ When firms cannot find good managers, firms may end up with poor managerial capacity or cannot expand even when it would be efficient for them to do so (Bloom et al., 2013).

To improve firm productivity, it is therefore important to consider the problem of how firms can find good managers. On the one hand, firms could promote existing workers to managerial positions based on seniority or observed performance. Such measures have the benefit of being transparent and objective. However, a potential drawback is that the most senior or the best workers may not make the best managers (Benson, Li, and Shue, 2020). This may be due, in part, to the fact that managerial roles often require specific skills and competencies, such as leadership, communication, and strategic thinking, that are not required in many other types of roles. Identifying which workers would perform well as future managers is therefore a challenging inference problem for the firm.

In practice, many firms delegate the selection of new managers to the decision of existing managers. In theory, such delegation can crowd in valuable private information that improves the quality of decision making (Aghion and Tirole, 1997; Dessein, 2002; Acemoglu et al., 2007; Bloom and Van Reenen, 2011). Supervisors often work closely with workers day to day and may therefore have the best knowledge of which workers are ready to step into new leadership roles. However, supervisors may also have bias, favoritism, or personal preferences when selecting workers for promotion that are not aligned with the firm’s interests. While managers often exercise discretion over various workplace decisions, ranging from project prioritization to production decisions, discretion over personnel decisions in particular may also have additional effects depending on how workers perceive and respond to discretion.

¹The Missing Middle Management,” The Global Prosperity Institute, May 29, 2023, https://www.thegpi.org/p/the-missing-middle-management?utm_campaign=post&utm_medium=web

Studying discretionary selection empirically is challenging, as selection processes within firms are usually a black box. Often, only realized promotions are observable in firm administrative data. In partnership with one of the largest garment manufacturing firms in Tanzania, we collect novel data and implement a series of field experiments during a period of firm expansion, when the firm was actively promoting assembly line-level workers to become supervisors in a new facility. In the status quo, our partner firm almost entirely delegates promotion decisions to existing supervisors. To study this selection, we directly elicit supervisors' discretionary choices and randomize whether supervisors face financial incentives based on the quality of their choices. This experimental variation allows us to test simultaneously 1) whether there are informational advantages to the firm to using discretion, and 2) whether supervisors make decisions in the best interest of the firm. On the sorting side, we then study how different selection methods affect workers' decisions to apply for promotion. By randomizing whether supervisor selection is emphasized during the application process, we test whether discretion affects the quantity and quality of workers who apply for promotion.

Specifically, in the selection experiment, all supervisors are asked to refer up to two workers for a leadership training program, which essentially fast tracks workers for promotion.² During the referral process, we randomize whether supervisors face financial incentives, worth roughly 10% of their monthly base wage, based on the quality of their referrals. Importantly, while incentivized supervisors are informed that their referrals will be verified by the firm for quality, they are not informed about the details of this verification process. In this way, the referral bonus is designed to bring supervisor referrals more in alignment with the firm, while preventing supervisors from simply "picking to the test." To guide our analysis, we use a simple conceptual framework adapted from Beaman and Magruder (2012), where supervisors trade-off using their private information about worker quality against their personal benefits from referring certain workers when making referral decisions. Our key outcome of interest is the managerial quality of referred workers. Under our conceptual framework, if the referral bonus improves the quality of referred workers, then this indicates simultaneously that supervisors have private information about the managerial quality of workers but also that there was misalignment of incentives in the status quo.

In terms of measurement, typically managerial ability is only observable for workers who are eventually promoted. However, to assess the selection and sorting effects

²Note that 24% of trained workers were promoted to a supervisor position within one year of the training, compared to less than 0.01% of non-trained workers receiving promotions.

of discretion, it is important to measure the managerial ability of the entire pool of workers who could be *potentially* promoted. To do so, we invite all workers who applied or who were referred for promotion to take an assessment of their managerial quality. Part of the test includes questions provided by the firm, which they believed would be effective screening questions. The remaining questions measure soft skills often cited in the literature, including conscientiousness, self-esteem, and perseverance³, as well as attributes that have been found to correlate specifically with manager value-add, including locus of control (Adhvaryu, Nyshadham, and Tamayo, 2023) and fluid intelligence (Weidmann et al., 2024). We use this measure of managerial quality as a main outcome variable across both the selection and sorting experiments. At the end of the experiments, we also verify this measure by having all existing supervisors take the assessment and correlate their scores with their observed performance as managers.

The results from the selection experiment suggest that supervisors have private information about the managerial quality of workers. Randomly assigned financial incentives lead supervisors to refer workers with 13% higher measured managerial quality on average relative to supervisors in the status quo. Through the lens of our conceptual framework, these results indicate that supervisors have private information about worker quality, otherwise the referral bonus would not have shifted selection along the desired dimension. However, supervisors were not using this information as much as they could have in the status quo, consistent with the existence of misalignment between the firms' and the supervisors' objectives.

As a robustness check, we replicate our selection experiment with a random sample of line-level workers who refer their coworkers for promotion. The randomization procedure, script, and referral bonus were identical to those used in our supervisor selection experiment. Our results show that incentivized coworkers, despite facing the same financial incentives as incentivized supervisors, do not refer workers with higher managerial quality. If anything, incentivized coworkers refer workers with more seniority. While we are unable to distinguish between potential mechanisms driving these choices, nevertheless, the average worker does not respond to financial incentives in the same way as the average supervisor. Taken together, this suggests that the results from our supervisor selection experiment are unlikely to be simply a mechanical response to incentives.

On the sorting side, we then study how different selection methods affect workers'

³For example, see Hurtz and Donovan (2000); Borghans et al. (2008); Almlund et al. (2011); Heckman and Kautz (2012); Donato et al. (2017).

decisions to apply for promotion. In lieu of discretion, firms could instead use objective performance data to make promotion decisions. To test how discretion compares to such alternatives, we vary the selection criteria that is emphasized on the application forms that workers receive. Specifically, in the Control group, we inform workers that selection will be based on many criteria, including their *performance record*. In the Discretionary group, we inform workers that selection will be based on many criteria, including their *supervisor referrals*. All other aspects of the application form and the promotion opportunity itself are identical across these two groups.

The results suggest that workers are responsive to selection methods and are averse to discretion. Randomly emphasizing supervisor referrals in the selection process significantly reduces the likelihood that workers apply for promotion, a 6.5 percentage point (12%) decrease relative to the control group (56% application rate). However, discretion does not significantly affect the managerial quality of applicants, neither the average nor the distribution of quality.

Taken together, the results suggest there are both benefits and costs to firms from relying on discretion in personnel decisions. On the one hand, discretion crowds in the valuable private information of supervisors, which significantly improves the managerial quality of promoted workers. On the other hand, supervisors do not always use their discretion in the best interest of the firm, and workers dislike discretion and are less likely to apply for promotion under discretionary selection.

How do these costs and benefits of discretion compare? To make progress on this question, we conduct a counterfactual exercise to compare supervisor selection to more objective selection methods, taking into account differences in worker self-selection under each method. First, we correlate our measure of managerial quality with the observed performance of existing supervisors on the job. We find that a supervisor's own score on the leadership test is significantly correlated with the performance of the workers and teams they supervise. A one standard deviation increase in supervisor quality is correlated with a 2.3% increase in daily worker productivity.

Next, we compare supervisor selection, restricting to the pool of workers who applied under Discretionary applications, to counterfactual selection by performance record, restricting to the pool of workers who applied under Control applications. Our analysis reveals that supervisors select workers with approximately 0.5 - 0.7 standard deviations higher managerial quality on average compared to more objective selection methods. Combined with our calibration of the management measure above, this suggests that

discretion leads to the promotion of higher quality managers who are correlated with 1.1 - 1.6% higher daily worker productivity. Thus, while discretion reduces the number of workers who pursue promotion opportunities, because worker self-selection and work performance are orthogonal to managerial quality, on net discretion still leads to the promotion of higher quality workers.

In practice, almost all firms rely on discretion to make promotion decisions. While theory suggests that discretion should have informational advantages for making personnel decisions, empirical evidence supporting this theoretical prediction is scarce. Notable exceptions are Voth and Xu (2022), who study discretionary promotions using historic data from the British Royal Navy, and Chen et al. (2025), who find that managers possess personnel-specific information in the context of firm poaching. We contribute to this literature by showing experimental evidence that supervisors have informational advantages about the managerial quality of workers through eliciting discretionary selection directly within a modern day, real firm.

In doing so, we contribute to a literature studying the use of discretion in personnel decisions. The existing literature has largely focused on studying horizontal referrals for hiring decisions and have found that such referrals can reduce moral hazard (Heath, 2018), improve match quality (Loury, 2006; Beaman and Magruder, 2012; Burks et al., 2015; Pallais and Sands, 2016), reduce turnover (Brown, Setren, and Topa, 2016), but also crowd in bias (Beaman, Keleher, and Magruder, 2018). Fewer studies have examined vertical referrals, and much of the existing literature concludes that vertical referrals (Hoffman, Kahn, and Li, 2018; Xu, 2018; Adhvaryu, Murathanoglu, and Nyshadham, 2023) and vertical performance evaluations (Benson, Li, and Shue, 2022; Brabner, Kunneke, and Moers, 2025) lead to sub-optimal personnel decisions. We use novel experimental evidence to show that vertical referrals crowd in valuable private information in the selection of managers.

We also contribute to a literature on the labor supply response to subjectivity. Existing evidence shows that exposure to promotions that workers perceive as unfair can negatively impact retention and effort on the job (Li, 2020; Deserranno, Kastrau, and Leon-Ciliotta, 2025). Managers have been shown to engage in talent-hoarding, which can deter internal job applications and inhibit career progression (Haegele, 2025). Other studies have shown that subjective performance evaluations can induce influence activities (De Janvry et al., 2023) but also reduce multi-tasking concerns (Andrabi and Brown, 2023). We contribute to this literature with experimental evidence on the effects of

supervisor discretion on workers’ decisions of whether to pursue managerial opportunities.

Finally, we contribute to a growing literature studying the importance of managers and managerial practices for firm performance (Bertrand and Schoar, 2003; Ichniowski and Shaw, 2003; Bandiera, Barankay, and Rasul, 2007; Bloom and Van Reenen, 2007, 2011; Bloom et al., 2013; Lazear, Shaw, and Stanton, 2015; Bruhn, Karlan, and Schoar, 2018; Bloom et al.; Giorcelli, 2019; Bandiera et al., 2020; Frederiksen, Kahn, and Lange, 2020; Gosnell, List, and Metcalfe, 2020; Hoffman and Tadelis, 2020; Sandvik et al., 2020; Bianchi and Giorcelli, 2022; Adhvaryu, Murathanoglu, and Nyshadham, 2023; Adhvaryu, Nyshadham, and Tamayo, 2023; Metcalfe, Sollaci, and Syverson, 2023; Adhvaryu et al., 2025). An open question in this literature is why, given the importance of managers, low managerial quality appears to be commonplace. Our findings highlight the trade-offs firms face when selecting workers for promotion that can contribute to the persistence of low managerial quality within firms.

The rest of this paper proceeds as follows. In Section 2, we provide more information about the study context and the data used throughout the analysis. We present the design and results of the selection experiment in Section 3 and for the sorting experiment in Section 4. Section 5 discusses the counterfactual analysis and Section 6 examines mechanisms and extensions. We discuss the findings and conclude in Section 7.

2 Context and Data

We partner with one of the largest garment manufacturing firms in Tanzania, which has been operating for over a decade and produces exclusively for exports. During the study period, between 2022 - 2024, the firm had on average over 4,000 full-time employees. Similar to the broader global garment industry, the majority of workers in the firm (80%) are female. On average, workers are 29 years of age and have been with the firm for over three years. In comparison, 62% of supervisors are female, and supervisors are on average somewhat older and have around two more years of tenure at the factory relative to the average worker (Table A.1).

Our study focuses on the production departments of the factory, including cutting, bartack, sewing, and finishing. Within these departments, workers are organized into production lines, each with on average 57 workers and 3 supervisors. As in most firms, lower-level workers and supervisors have very different types of jobs and responsibilities. Line-level workers do highly repetitive and manual tasks, such as cutting panels, attaching

buttons, or hemming seams, with workers moving to more challenging tasks as they gain experience. In contrast, a supervisor’s main responsibilities are to meet production targets and timelines, including allocating workers to tasks, identifying and solving production problems, such as from unexpected absences or machine breakdowns, and motivating and monitoring worker effort. When asked, supervisors say their role requires problem solving, leadership, communication, and discipline, corresponding with soft skills often cited in the management literature. Identifying which workers would perform well as future managers is therefore a challenging inference problem for the firm, as the best line-workers workers may not make the best managers in this setting.

As in many private sector contexts, the firm offers performance pay to workers and supervisors. Workers earn a monthly base salary based on attendance as well as weekly individual bonus, based on their individual output, and group bonus, based on the overall output of their line. The median supervisor’s base salary is 125% of the median worker’s base salary. Supervisors also earn around double the group bonus that workers earn when their lines achieve their daily production targets. Bonus earnings can be substantial. The median worker earns monthly bonuses equivalent to 46% of the median worker base salary, and the median supervisor earns bonuses equivalent to roughly 80% of the median supervisor base salary.

Supervisor discretion is a regular part of a worker’s experience on the job. Many status quo decisions in the factory rely on supervisor discretion, including a variety of personnel decisions. The factory relies almost solely on supervisors to choose which workers to hire, allocate workers to tasks, and select workers for promotion. While the factory has some rules-based procedures for how to reward worker effort and discipline shirking, supervisors also have some discretion across these domains.

2.1 Timeline

During our study period, our partner firm planned to open a new facility that would create at least 15 promotion opportunities for line-level workers to become new supervisors. As part of the selection process, the firm first chose workers for a leadership training program (June - August, 2023), representing a significant investment in developing workers’ managerial capacity. Only 30 training spots were available, making the selection process highly competitive. The training included one week of management soft skills training implemented by an external consulting firm as well as on-the-job shadowing of existing supervisors. Workers who successfully completed the training

program were fast tracked for promotion. However, due to unforeseen circumstances, the opening of the new facility was delayed by a year. The firm therefore also conducted a second selection process (June - July 2024) closer to the actual opening of the facility to fill the remaining supervisor vacancies. In total, 24% of trained workers were eventually promoted to become supervisors in the new facility, compared to less than 0.01% of non-trained workers receiving promotions. Our main selection and sorting experiments occur during the first selection round that the firm conducted. We also collect survey data from workers and supervisors during the second selection round. A detailed timeline of the study is presented in Figure A.1.

2.2 Data

The factory collects regular administrative data on its employees, which we use throughout our analysis. Available demographic information includes worker gender, religion, date of birth, and marital status. In addition, the firm regularly collects performance-related information, including tenure, daily attendance, hours worked, key performance indicators (KPIs), line-level output, individual bonus earnings, and group bonus earnings.

From June 2022 - September 2023, the factory also collected individual-level output data. Most workers are assigned to a task that has a task-specific production target. For example, loop cutters are expected to cut 23,000 loops a day to meet their daily production target while waistband attachers are expected to attach 500 waistbands to meet their daily target. Throughout our analysis, we therefore scale individual output by the relevant task-specific target (“Output/Target”) to measure worker productivity.

In addition to firm administrative data, we also collect referral and application choices through our experiments, and measure the managerial ability of workers who were referred or who applied as a key outcome variable. Follow-up surveys with workers and supervisors were conducted during the factory’s second selection round, roughly a year after the experiments were conducted, to help shed light on mechanisms. The worker survey asked opinion questions regarding the general workplace environment, the factory’s promotion process, relationships with supervisors, and self-evaluations of work performance (see Appendix F for the full survey instrument). In total, 1,593 workers took the opinion survey, and around half (52%) of the workers who participated in the application experiment the year prior participated. The supervisor survey asked for referrals for the second selection round, performance evaluations for a random subset

of the workers that each supervisor manages, as well as opinion questions about social preferences and the promotion processes of the firm (see Appendix G for the full survey instrument). In total, 116 supervisors took the follow-up supervisor survey, and similarly around half (47%) of the supervisors who participated in the referrals experiment the year prior participated.

2.3 Measuring Managerial Quality

Typically, managerial ability is only observable for workers who are eventually promoted. To assess the selection and sorting effects of discretion, however, it is important to measure the managerial ability of the entire pool of workers who could be potentially promoted. To this end, we introduce a written assessment to measure workers' managerial potential. Part of the test includes questions provided by the firm, which they believed would be effective screening questions. These questions mainly cover firm-specific production processes and technical knowledge. The remaining questions measure soft skills often cited in the literature, including conscientiousness, self-esteem, and perseverance (Hurtz and Donovan, 2000; Borghans et al., 2008; Almlund et al., 2011; Heckman and Kautz, 2012; Donato et al., 2017), as well as attributes that have been found to correlate specifically with manager value-add, including locus of control (Adhvaryu, Nyshadham, and Tamayo, 2023) and cognitive ability (Weidmann et al., 2024). The latter included mathematical reasoning questions as well as Raven's matrices to measure fluid intelligence (see Appendix C for the full test instrument). We use this measure of managerial quality as a main outcome of interest throughout our analysis.

Note that the managerial assessment occurred after both workers made their application decisions and supervisors made their referral decisions. Furthermore, workers and supervisors were not informed of the test in advance, so the existence of the test itself could not have affected application or referral decisions directly.

All workers who applied for promotion or who were referred by either a supervisor or coworker for promotion were invited to take the management test, with 728 workers in total taking the test in the first selection round. Among those who took the test, 502 (81%) applied for promotion, 137 (19%) were referred by any supervisor, and 249 (34%) were referred by any coworker. In addition, during the second selection round one year later, any worker who was interested in the promotion opportunity could voluntarily take a new version of the test. This resulted in 886 workers taking the test in the second round, where 226 (26%) of these workers had already taken the test in the first round.

For workers who took the test twice, their performance appears relatively stable over time, with a correlation of 59% in scores across rounds.

Our measure of managerial quality appears to pick up something that is not well captured by existing administrative data available to the firm. We find that observable worker characteristics, including past performance and demographics, only explain between 2-7% of the variation in measured managerial ability (Table A.3). Relaxing functional form assumptions does not improve predictability, as seen in Column 4 of Table A.3. This pattern is consistent with the idea that such line-level manufacturing roles can be performed well without requiring managerial ability. At the end of the experiments, we also verify this measure by having all existing supervisors take the assessment and correlate their scores with their observed performance as managers (see Section 5.1).

3 Selection when supervisors have discretion

Firms often delegate the selection of new managers to the discretion of existing managers. What are the costs and benefits of doing so? To study discretionary selection, we directly elicit supervisors' promotion choices and randomize whether supervisors face financial incentives based on the quality of their choices. Under a simple conceptual framework, our experimental design allows us to test simultaneously whether supervisors have private information about the managerial quality of workers and whether their discretionary referrals are aligned with firm objectives.

3.1 Selection Experiment: Design

In the experiment, all supervisors are given the opportunity to refer up to two workers for the leadership training, which essentially fast tracks workers for promotion to managerial positions. Supervisors are informed that the purpose of the training is to “identify promising workers and train them in technical production skills, leadership, and management skills” and that “the HR team will select workers for the training based on a variety of criteria, including supervisor referrals” (see Appendix D for the full script).

During the referral process, we introduce a bonus based on the quality of the referral, worth approximately 10% of the median supervisor monthly base wage. Importantly, while supervisors are informed that their referrals will be verified by the firm for quality, they are not informed about the specific measures that the firm will use. In particular, supervisors are told “for each worker you refer, if that worker successfully completes the

entire training and scores within the top 50% of the training cohort, as measured by their scores on a verbal technical test and panel interview, you will receive a referral bonus of 20,000Tsh.” In this way, the referral bonus is designed to bring supervisor referrals more in alignment with the firm without revealing detailed information about the firm’s objectives, reducing the ability of supervisors to select “to the test.”⁴

To generate random variation in incentives, we experimentally vary the *timing* of announcement of the referral bonus. In the Control group, supervisors first give their referrals and are then informed of the referral bonus. This process essentially elicits the referrals that occur in the status quo without additional incentives. In contrast, in the Incentivized group, supervisors are informed of the referral bonus *before* they give their referrals, which elicits referrals under financial incentives for quality. This random variation in timing allows us to measure the effect of the referral bonus without actually withholding the referral bonus from some supervisors, a key fairness consideration when implementing an experiment with real employees in a real firm.

To conduct the randomization, all supervisors from the production departments were first invited to an introductory session about the leadership training program. Within the session, supervisors were counted off into two groups consecutively in the order in which they were seated. The two groups were then led to separate rooms to complete the referral process, with one group randomly assigned to receive the Control group script while the other group was randomly assigned to receive the Incentivized group script. Trained session moderators then followed the assigned scripts to explain the referral process to supervisors. The content of the scripts were identical between the two groups, the only difference in the scripts was whether the referral bonus was announced before or after supervisors gave their referrals. All supervisors gave their referrals via written forms during the one hour session. This procedure standardizes the referral process and bounds the effort and inputs that supervisors could use to make referral decisions. For example, supervisors could not contact workers directly or review past records or CVs before making their referral decisions.

⁴Following classic moral hazard models with multi-tasking (Baker, 2002), supervisors may prioritize selecting based on measurable dimensions of quality at the expense of other dimensions of quality that are also important. Our referral bonus is designed so that supervisors are informed that their referrals will be assessed for quality, but supervisors are not informed of the explicit dimensions that will be measured, reducing multi-tasking concerns.

3.2 Selection Experiment: Conceptual Framework

We use a simple conceptual framework adapted from Beaman and Magruder (2012) to illustrate the potential trade-offs a supervisor faces when selecting workers for promotion. By incorporating financial incentives based on referral quality and heterogeneity in imperfect information on the part of the supervisor, it highlights how incentives can affect promotion choices and what we can identify in our selection experiment.

Supervisor i has the opportunity to choose a worker for promotion. In making a selection, each supervisor chooses among the workers that they know in the firm. Each worker j has an inherent ability at the promotion position, either high or low, where $\theta_j \in \{\theta^H, \theta^L\}$. The supervisor is offered a referral bonus P_i , where she will receive P_i if she correctly selects a high-ability worker ($\theta_j = \theta^H$). The supervisor observes a signal of each worker's ability, $\hat{\theta}_j \in \{\theta^H, \theta^L\}$, which is accurate with probability $\beta_i = P(\theta = \theta^H | \hat{\theta} = \theta^H, i) = P(\theta = \theta^L | \hat{\theta} = \theta^L, i)$, where $\beta_i \in (0.5, 1]$. The supervisor also gains personal benefits σ_{ij} from referring each specific worker j , such as arising from bias, patronage, or favoritism. Suppose the effort of making a referral will cost her c_i .

Since there are two ability types of workers, it is without loss of generality to focus on the decision between worker 1, for whom $\sigma_{i1} \in \argmax(\sigma_{ij} | \hat{\theta}_j = \theta^H)$ and worker 2, for whom $\sigma_{i2} \in \argmax(\sigma_{ij} | \hat{\theta}_j = \theta^L)$. If the supervisor selects worker 1, then she will receive in expectation $\beta_i P_i + \sigma_{i1} - c_i$. If she instead selects worker 2, she will receive in expectation $(1 - \beta_i) P_i + \sigma_{i2} - c_i$. Comparing these two expressions, a supervisor will select the higher quality worker if

$$P_i > \frac{\sigma_{i1} - \sigma_{i2}}{2\beta_i - 1}$$

An empirical implication of the model is that there are four necessary characteristics for a referral bonus to increase the quality of the selected worker: (i) workers must be heterogeneous, so that i observes workers with both types of signals; (ii) there must be trade-offs between a supervisor's personal incentives and the firm's incentives ($\sigma_{i2} - \sigma_{i1} > 0$); (iii) the trade-offs must not be too large relative to P_i ; and (iv) supervisor i receives at least weakly informative signals about the quality of workers, so that $\beta_i > 0.5$.

In our selection experiment, we randomly vary whether $P_i = 0$ or $P_i = 20,000$ Tsh. If we observe an increase in the quality of selected workers in response to the referral bonus, we will be able to conclude that supervisors have all four of those characteristics. If the

referral bonus does not change the quality of selected workers, then we cannot distinguish between these mechanisms.

3.3 Selection Experiment Results

In total, we invited 120 supervisors to participate in the referral experiment, 118 of which participated. From our randomization procedure, 58 supervisors were randomly assigned to the Control group and 60 were randomly assigned to the Incentivized group. Table A.4 shows that our treatment assignment produced two groups that are balanced on observable characteristics.

All supervisors referred at least one worker, and 110 (93%) referred two workers, generating 228 referrals in total. Of these referrals, 22 workers were referred by more than one supervisor, generating a sample of 206 unique workers who were referred by any supervisor. All workers who were referred by a supervisor for promotion were invited to take the managerial assessment. Among the 228 referrals, 40 (18%) could not be matched to a current worker employed at the factory. Among the 188 referrals, representing 166 unique workers, that were matched and therefore invited to take the test, 161 (86%), representing 140 unique workers, actually showed up and took the test. Attrition at both stages is balanced by the treatment assignment of the referring supervisor (Table A.5).

Under our conceptual framework, our main outcome of interest is whether the referral bonus affects the managerial quality of the workers that supervisors refer. Specifically, we estimate the following model for the set of referrals made by supervisors:

$$M_{ij} = \alpha + \beta T_i + X_i + \varepsilon_{ij} \quad (1)$$

where M_{ij} is the measured managerial quality of worker j referred by supervisor i ; T_i is an indicator variable for whether the supervisor was randomly assigned to the Incentivized group; and X_i is a vector of supervisor controls, including gender, religion, marital status, and tenure. Standard errors are clustered at the supervisor level. We estimate Equation 1 for the total score on the managerial test as well as the scores on each sub-section of the test: production, soft skills, and logical reasoning.

Note that while we use the managerial test to assess the quality of supervisor referrals, the test scores themselves were not what supervisors' referral bonuses were based on. Instead, supervisor referral bonuses were determined by a separate test and panel interview process administered only to trained workers at the end of the training. Given these factors, it is unlikely that supervisors selected workers "to the test."

Our estimates from estimating Equation 1 are reported in Table 1.⁵ The results indicate that financial incentives increase the managerial quality of referred workers. Incentivized supervisors refer workers who score on average 6 points higher on the leadership test, a 13% increase relative to workers referred by Control supervisors. This result is driven by Incentivized supervisors referring workers with relatively higher scores on the soft skills and logical reasoning portions of the test.

Table 1: Effect of Referral Bonus on the Quality of Referred Workers

	(1)	(2)	(3)	(4)
	Total Score	Production Score	Traits Score	Logic Score
Incentivized Supervisor Referral	6.067** (2.735)	0.469 (1.996)	3.466*** (1.056)	2.131** (0.822)
Control Mean	45.763	29.100	9.787	6.875
Control SD	17.071	10.507	6.031	5.583
Supervisor Controls	✓	✓	✓	✓
N Referrals	161	161	161	161

Notes: This table reports the effects of randomized referral incentives on the managerial quality of the workers referred by supervisors. Quality is measured by a worker’s score on a management test, including the total score and the score on each sub-section of the test. Supervisor controls, including the supervisor’s gender, religion, tenure, and marital status, are included in all regressions. Standard errors are clustered by supervisor. *p < 0.1, ** p < 0.05, *** p < 0.01.

Through the lens of our conceptual framework, these results indicate simultaneously that supervisors have private information about worker quality and that there are trade-offs between supervisors’ personal preferences and the firm’s objectives. Intuitively, supervisors must have private information on quality, otherwise the referral bonus would not have shifted referrals along the quality dimension. However, supervisors were also not using this private information as much as they could have in the status quo, consistent with the existence of misalignment between the firms’ and the supervisors’ objectives.

Alternatively, the results could also be driven by increased supervisor cognitive effort under incentives, which would also be consistent with this interpretation. It could be the case that supervisors exert less effort in making promotion decisions in the status quo. When they are offered a financial incentive, they exert more effort in response. In this case, supervisors would still need to have private information about the managerial quality of workers, otherwise higher effort would not result in higher quality referrals. Likewise, the firm presumably wants the supervisor to exert as much effort as possible,

⁵Note that for three supervisors we were missing information on their religion, marital status, and tenure. In Table 1 we report our results where we have imputed the median values from the sample for these missing variables. Our results are very similar if we drop these observations.

but supervisors exert a sub-optimal level of effort in the absence of additional incentives, consistent with principle-agent misalignment.

3.4 Replication of Selection Experiment with Coworkers

As a robustness check, we replicate the selection experiment with a randomly selected sample of line-level workers who are asked to refer their coworkers for promotion. As in the supervisor selection experiment, we randomize whether coworkers face financial incentives based on the quality of their referrals. The script, randomization procedure, and bonus amount are identical to those used in the supervisor selection experiment. Note that the coworker selection experiment took place the day after the supervisor selection experiment.

To construct our sample of coworkers, we randomly select 291 workers who had participated in the sorting experiment, with selection stratified by prior treatment assignment and production line. In total, 237 out of the 291 (81%) invited coworkers participated. While the initial random sample of coworkers is representative of the broader workforce (Table A.6), coworkers who participated in the selection experiment are different from those who chose not to participate across some demographic and work characteristics. For example, workers who participated are less likely to be married, have fewer disciplinary issues, and earned lower bonuses on average relative to those who did not participate. Nevertheless, participation did not significantly differ by a worker’s treatment assignment or application decisions in the sorting experiment.

Our randomization procedure resulted in 114 coworkers randomly assigned to the Control group and 123 randomly assigned to the Incentivized group. Among coworkers who participated in the experiment, our treatment assignment generated two groups that are balanced on observable characteristics (Table A.7). All coworkers referred at least one worker, and 212 (90%) referred two workers, generating 449 referrals. Of these referrals, 70 workers were referred by more than one coworker, generating a sample of 378 unique workers who were referred by any coworker. All workers who were referred by a coworker for promotion were invited to take the managerial assessment. Among the 448 referrals, 91 (20%) could not be matched to a current worker employed at the factory. Among the 357 referrals, representing 294 unique workers, that were matched and therefore invited to take the test, 308 (86%), representing 250 unique workers, actually showed up and took the test. Attrition rates at both stages are comparable to those from the supervisor selection experiment and are balanced by the treatment assignment of the

referring coworker (Table A.8).

As in the supervisor selection experiment, our main outcome of interest is the managerial quality of workers referred by coworkers. We estimate Equation 1 for the set of referrals made by any coworker and report our results in Table 2. Our results show that Incentivized coworkers, despite facing the same financial incentives as Incentivized supervisors, do not refer workers with higher managerial quality. Heterogeneity analysis shows that, if anything, incentivized coworkers refer workers with more seniority and higher productivity (see Section 6.1). In fact, there is little overlap between supervisor and coworker referrals. Only 10% of the workers referred by any coworker are also referred by a supervisor.

Table 2: Effect of Referral Bonus on the Quality of Referred Workers: Coworker Experiment

	(1)	(2)	(3)	(4)
	Total Score	Production Score	Traits Score	Logic Score
Incentivized Coworker Referral	-2.855 (1.733)	-2.654*** (0.996)	-0.025 (0.656)	-0.175 (0.545)
Control Mean	50.223	33.079	10.583	6.561
Control SD	14.076	7.946	5.586	4.644
N Referrals	308	308	308	308

Notes: This table reports the effects of randomized referral incentives on the managerial quality of the workers referred by coworkers. Quality is measured by a worker’s score on a management test, including the total score and the score on each sub-section of the test. Coworker controls, including the coworker’s gender, religion, tenure, and marital status, are included in all regressions. Standard errors are clustered by coworker. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Under our conceptual framework, we are unable to distinguish between potential mechanisms underlying this result. It could be the case that coworkers do not have relevant private information, or that there are no conflicts of interests between coworkers and the firm to begin with. Alternatively, there may be conflicts of interest but the performance bonus may not be large enough to overcome them. Nevertheless, the evidence suggests that the results of the supervisor selection experiment are unlikely to be simply mechanical. The average supervisor responds to financial incentives for quality differently than the average worker when making promotion decisions.

4 Sorting under Supervisor Discretion

Given that firms often rely on supervisor discretion to make various personnel decisions, how do workers respond to the use of such discretion? To study this question,

we implement a complementary field experiment with workers to study how emphasizing different aspects of the selection process affect workers’ decisions to apply for promotion.

4.1 Sorting Experiment: Design

All workers from the production departments of the two largest facilities of the factory were invited to an introductory session to learn about the leadership training opportunity. During this session, workers were also given the opportunity to apply for the training program. All workers received the same information about the opportunity but were randomly assigned to receive different versions of the application form. The application forms differed in whether they emphasized the role of supervisor referrals in the selection process but were otherwise identical.

Specifically, the Control version of the application form states that workers will be selected based on many criteria, including their *performance record*. In contrast, the Discretionary application form states that workers will be selected based on many criteria, including their *supervisor referrals* (see Appendix E for the full application forms). We chose the wording for the Control application to reflect the fact that, in the absence of supervisor referrals, performance records are the only existing information available to the firm to make promotion decisions.

To conduct the randomization, we adopt a similar method to Bursztyn, Egorov, and Jensen (2019) and presort Control and Discretionary application forms in an alternating pattern and then distribute forms to workers consecutively in the order that they are seated. Workers were told to complete their application forms without talking or looking at the forms of other workers in the session.

Throughout our analysis, we focus on measuring both the quantity and quality of workers who apply for promotion. Ex-ante it is unclear what effects, if any, we should expect to see from varying the selection criteria. In terms of quantity, we may expect more applications under the selection method that either more workers prefer or believe they are favored by. In terms of quality, if workers with better performance records are more likely to apply when performance is emphasized, while workers who are favored by supervisors are more likely to apply under discretion, then we would expect workers with higher managerial quality to apply under discretion. This is because supervisors are more likely to select workers with higher managerial quality (Table 1), while observable performance metrics appear to be only weakly correlated with managerial quality in this context (Table A.3).

4.2 Sorting Experiment: Results

In total, 1,118 workers participated in the application experiment, 559 of which were randomly assigned to receive Control application forms and 559 to receive Discretionary forms. Table A.9 shows that our random assignment method generated two groups that are balanced on observable characteristics.

To measure the effects of discretion on workers' application decisions, we estimate the following regression:

$$Apply_i = \alpha + \beta T_i + X_i + \varepsilon_i \quad (2)$$

where $Apply_i$ is an indicator variable for whether worker i applies for the leadership training; T_i is an indicator variable for whether the worker received a Discretionary application form; and X_i is a vector of worker controls, including demographics (gender, religion, and marital status) and work performance in the prior year (output/target, individual bonus, group bonus, attendance, KPIs, and a quadratic for tenure). To test the sensitivity of our results to functional form assumptions, we estimate Equation 2 using OLS and Logit.

Table 3: Effect of Discretion on Application Rates

	OLS (Apply = 1)			Logit (Apply = 1)
	(1)	(2)	(3)	(4)
Discretionary Application	-0.064** (0.030)	-0.068** (0.031)	-0.066** (0.031)	-0.066** (0.030)
Control Mean	0.562	0.564	0.561	0.561
Control SD	0.497	0.496	0.497	0.497
N Workers	1,118	1,048	1,023	1,019
Worker Controls		✓	✓	✓
Line FEs			✓	✓

Notes: This table reports the effect of receiving a Discretionary application form on application rates. Columns (1), (2), and (3) report the results from estimating Equation 2 using OLS, with robust standard errors reported in parentheses. Column (4) reports average marginal effects from estimating Equation 2 using a Logit model, with standard errors for average marginal effects reported in parentheses. Worker controls include demographic variables (gender, religion, marital status) and work performance in the prior year (output/target, individual bonus, group bonus, attendance, KPIs, and a quadratic for tenure). Columns (3) and (4) also include production line fixed effects. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table 3 reports the results from estimating Equation 2. Our results show that worker behavior is sensitive to the perceived importance of supervisors in the selection process.

Emphasizing discretionary selection criteria leads significantly fewer workers to apply for the promotion-related opportunity, a 6.8 percentage point (12%) decrease relative to the Control group. These results are robust across different specifications, including using different sets of control variables and using a LPM or Logit model.

Next, we examine whether different selection methods affect the managerial quality of applicants. One limitation is that only workers who applied were invited to take the managerial assessment. We therefore cannot compare the managerial quality of workers who chose not to apply to those that applied. Nevertheless, we can compare the managerial quality of workers who apply under the two different selection methods. All 592 workers who applied for promotion were invited to take the test, and 502 (85%) of those invited actually took the test. Attrition is balanced by a worker’s treatment assignment and is comparable to attrition rates across the selection experiments (Table A.10).

Our results show that the average managerial quality across applicants under Discretionary selection do not differ significantly from control applicants, neither in the overall managerial score nor on any subsection of the assessment (Table 4). Furthermore, we also cannot reject that the applicant pools under both selection methods have the same distribution of managerial quality (Figure 1). Taken together, results from the sorting experiment show that discretion affects the quantity but not the quality of workers that apply for promotion.

Table 4: Effect of Discretion on Applicant Quality

	(1) Total Score	(2) Production Score	(3) Traits Score	(4) Logic Score
Discretionary Application	0.323 (1.390)	0.057 (0.761)	-0.069 (0.536)	0.336 (0.438)
Control Mean	48.533	31.782	10.490	6.261
Control SD	15.071	8.198	5.849	4.771
N Workers	477	477	477	477
Worker Controls	✓	✓	✓	✓

Notes: This table reports the effects of randomized Discretionary applications on the managerial quality of workers who choose to apply for promotion. Quality is measured by a worker’s score on a management test, including the total score and the score on each sub-section of the test. Worker controls include demographic variables (gender, religion, marital status) and work performance in the prior year (output/target, individual bonus, group bonus, attendance, KPIs, and a quadratic for tenure). *p < 0.1, ** p < 0.05, *** p < 0.01.

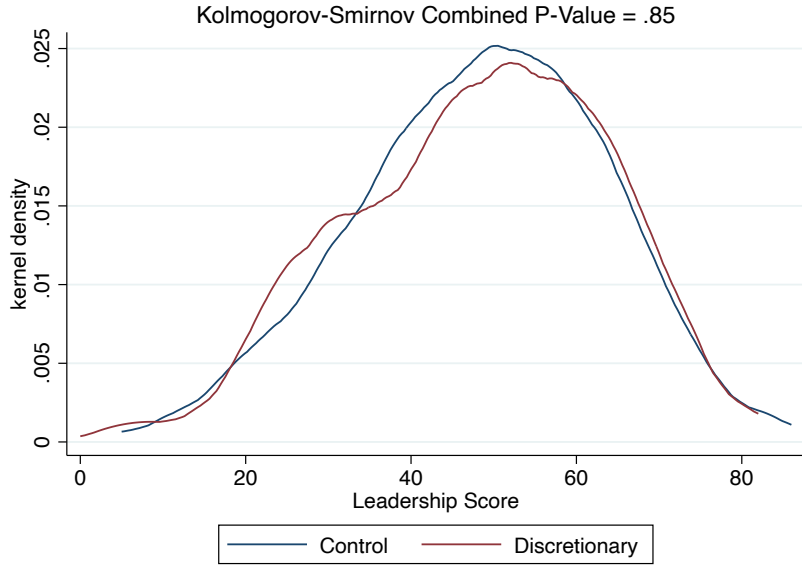


Figure 1: Distribution of Managerial Quality of Applicants across Selection Methods
Notes: This figure shows the kernel density of the distribution of leadership scores among workers who applied under Control and Discretionary applications specifically. The p-value from the combined two-sample Kolmogorov-Smirnov test for equality of distribution functions is reported.

5 Counterfactual Analysis

The results from the Selection and Sorting experiments show that there are both benefits and costs to firms from relying on supervisor discretion to make personnel decisions. On the one hand, discretion crowds in the valuable private information of supervisors. On the other hand, supervisors do not always use their discretion in the best interest of the firm, and workers dislike discretion and are less likely to apply for promotion under discretionary selection. How do these costs and benefits of discretion compare? To make progress on this question, we conduct a counterfactual analysis to compare supervisor selection to more objective methods, taking into account differences in worker self-selection under each method.

5.1 Calibrating Measure of Managerial Quality

First, we assess whether our measure of managerial quality correlates with observed managerial performance within our partner firm. To do so, all supervisors from the main production facilities were invited to take the managerial assessment themselves after the experiments were completed. In total, 104 supervisors completed the test, including 80% of the supervisors who participated in the selection experiment. We then compare their test scores to their observed performance as supervisors.

A key limitation in assessing our management measure is that supervisors and workers seldom switch teams in this context. During the 16 months when the factory collected individual output data, 66% of workers never switched teams. Workers who switch teams are different from workers who never switch, switchers on average have higher productivity and better attendance. Nevertheless, conditional on switching, workers are equally likely to switch to a team with higher or lower quality supervisors, as measured by the average scores on the management test of the supervisors on each team (p-value of difference in means = 0.900). Similarly, 68% of supervisors never switched teams, and supervisors who have higher managerial quality are more likely to switch. Nevertheless, conditional on switching, supervisors are equally likely to switch to a team with higher or lower average productivity the previous day (p-value of difference in means = 0.626).

We first estimate whether supervisor management scores correlate with the individual-level output of the workers they supervise in the cross-section, by estimating the following model using daily-level panel data on worker output:

$$Output/Target_{it} = \alpha + \beta SupervisorScore_{it} + X_i + S_{it} + \delta_w + \gamma_f + \varepsilon_{it} \quad (3)$$

where $Output/Target_{it}$ is the output of worker i on day t , scaled by task-specific targets; $SupervisorScore_{it}$ is the average management score of the supervisors assigned to worker i 's team on day t ; X_i is a vector of worker controls, including a worker's gender, religion, marital status, and a quadratic for tenure; S_{it} is a vector of controls for the supervisors assigned to worker i 's team on day t , including the number of supervisors, the percentage of supervisors who are female, the percentage of supervisors who are Muslim, and the average tenure of the supervisors; δ_w are week fixed effects; and γ_f are facility fixed effects. We cluster standard errors at the worker level.

We also estimate whether supervisor management scores correlate with line-level output in the cross-section by estimating an analogous regression using daily-level panel data on line-level output:

$$Output_{lt} = \alpha + \beta SupervisorScore_{lt} + X_{lm} + S_{lt} + \delta_w + \gamma_f + \varepsilon_{lt} \quad (4)$$

where $Output_{lt}$ is the output of line l on day t ; $SupervisorScore_{lt}$ is the average management score of the supervisors assigned to line l on day t ; X_{lm} is a vector of line controls, including the number of workers assigned to that line at the monthly level; S_{lt} is a vector of controls for the supervisors assigned to line l on day t , including the number of supervisors, the percentage of supervisors who are female, the percentage of

supervisors who are Muslim, and the average tenure of the supervisors; δ_w are week fixed effects; and γ_f are facility fixed effects. We cluster standard errors at the line level. Note that the factory only collects line-level output data for their sewing assembly lines, which covers about a third of the workers from the main production facilities.

Finally, we also estimate whether this correlation exists within workers and teams, using variation from workers switching lines and supervisors switching lines, by adding worker fixed effects and team fixed effects to Equations 3 and 4 respectively.

Our results from estimating Equations 3 and 4 are reported in Table 5. Overall, it appears that supervisor managerial scores are correlated with a 2.3% increase in daily worker productivity, and this relationship is robust to different control variables and is true both across workers and within the same worker. Supervisor management scores are also positively correlated with line output, although this relationship is noisier given that we only observe output data for 24 production lines, which represents about one third of workers from the main production facilities. While descriptive, our results suggest that our measure of managerial quality significantly predicts managerial performance in this setting.

Table 5: Supervisor Management Scores and Output

	Individual Output/Target			Line Output		
	(1)	(2)	(3)	(4)	(5)	(6)
Supervisor Leadership Score	0.021** (0.009)	0.021** (0.010)	0.023** (0.010)	21.677 (18.349)	31.511* (16.998)	49.140 (43.074)
Mean	0.918	0.918	0.914	1206.402	1229.098	1229.098
SD	0.555	0.555	0.542	395.217	392.558	392.558
Week FEs	✓	✓	✓	✓	✓	✓
Factory FEs	✓	✓	✓	✓	✓	✓
Worker controls	✓	✓				
Supervisor Controls		✓	✓		✓	✓
Unit FEs			✓			✓
Number of Units	2,277	2,277	2,741	24	24	24
Avg Number of Days	125	125	113	191	176	176

Notes: This table reports the regression coefficients of the average management score of supervisors assigned to each worker/team on daily individual worker output, scaled to task-specific targets in Columns (1) - (3) and on daily line-level output in Columns (4) - (6). Standard errors are clustered at the worker-level in Columns (1) - (3) and at the line level in Columns (4) - (6) and are reported in parentheses. Worker controls include gender, religion, marital status, and a quadratic for tenure. Supervisor controls include the number of supervisors assigned to each worker/team and the average gender, religion, and tenure of supervisors assigned to each worker/team. Columns (4) - (6) additionally control for the number of workers assigned to each line at the monthly level. *p < 0.1, ** p < 0.05, *** p < 0.01.

5.2 Comparing Selection Methods

We next combine the application decisions of workers with the selection choices of supervisors and compare discretionary selection to counterfactual selection methods available to the firm. In the selection experiment, supervisors selected 30 workers for promotion who happened to also apply for promotion under Discretionary applications (pooling together referrals from both Control and Incentivized supervisors). We therefore compare this supervisor selection to the workers that would have been selected based on their performance record, drawing from the pool of workers who applied under Control applications.

Specifically, we select the top 30 workers who applied under Control applications who have the best performance record, where we equally weight a worker’s productivity, attendance, and tenure, and disqualify any workers with current disciplinary issues. We construct this selection metric based on discussions with factory management about the relative importance of each aspect of a worker’s performance record for promotion decisions. As an additional benchmark, we also estimate a counterfactual where the 30 most senior workers are promoted, also drawing from the Control applicant pool.

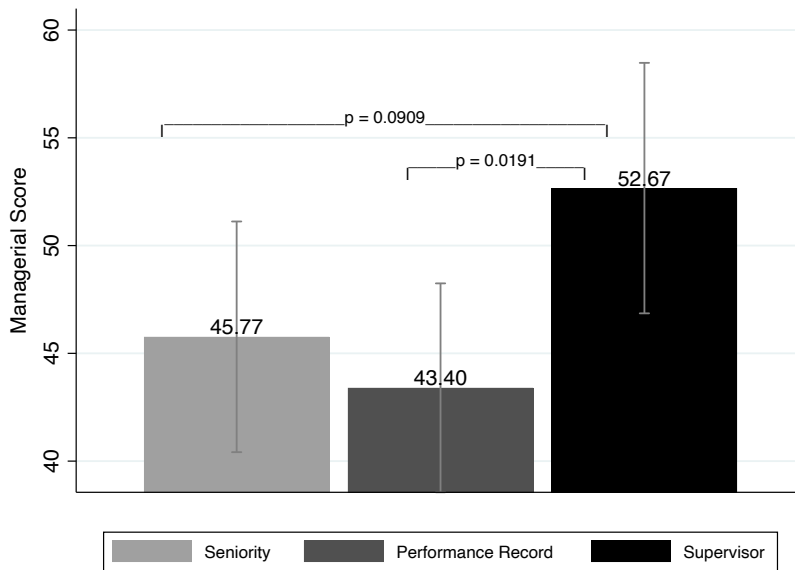


Figure 2: Average Managerial Quality of Selected Workers across Methods

Notes: This figure illustrates the average managerial quality of workers selected by discretion from the Discretionary applicant pool (Supervisor); by performance record from the Control applicant pool, using a rules-based method that equally weights a worker’s past output/target, attendance, and tenure and disqualifies any workers with current disciplinary issues; (and by seniority from the Control applicant pool (Seniority). 95% confidence intervals are displayed. The p-values from the two-sided hypothesis tests of equality of sample means between selection methods are also reported.

This counterfactual analysis reveals that supervisors select workers with

approximately 0.5 - 0.7 standard deviations higher managerial quality on average compared to more objective selection methods (Figure 2), with the relevant standard deviation being the SD of the Supervisor leadership scores, 13.06. Combined with our calibration of the management measure above, this suggests that discretion leads to the promotion of higher quality managers who are correlated with 1.1-1.6% higher daily worker productivity on average. Thus, while discretion reduces the number of workers who pursue promotion opportunities, because worker self-selection and work performance are both orthogonal to managerial quality, on net discretion still leads to the promotion of higher quality workers.

6 Mechanisms and Extensions

We conduct heterogeneity analysis and draw on survey evidence to help shed light on mechanisms underlying our main experimental results. We also test the external validity of our results and find that supervisors appear to use their private information in naturally occurring, high stakes referrals beyond our experimental context.

6.1 Selection Experiments: Heterogeneity Analysis

6.1.1 Characteristics of Referrers

If the selection experiment results are truly driven by private information, then we would expect supervisors who are more likely to have more private information to refer higher quality workers. We therefore check whether a supervisor’s own score on the managerial test predicts the quality of their referrals, consistent with the idea that it “takes one to know one.”

Our results show that a supervisor’s own managerial score is significantly correlated with the average score of the workers he or she refers (Table A.11). This relationship is true for the overall test as well as for the sub-components of the test. Supervisors who score higher on production questions refer workers who score significantly higher on production questions and likewise supervisors who score higher on logic questions refer workers who score higher on logic questions.

6.1.2 Characteristics of Referred Workers

We also check whether the referral bonus affected the characteristics of referred workers along other dimensions besides managerial quality. To do so, we estimate

Equation 1 for a variety of worker characteristics including demographics (gender, religion, marital status, and tenure) and work performance in the prior year (output/target, individual bonus, attendance, and KPIs). We also estimate Equation 1 for measures of potential supervisor favoritism, including the degree of homophily with the referring supervisor by gender and religion, as well as the extent to which a worker experienced beneficial supervisor discretion in the past in their KPIs and bonus earnings (see Appendix B for details on how we construct these measures).

Our results in Table A.12 show that the referral bonus does not significantly change any other characteristics of referred workers beyond their managerial quality. In contrast, when we conduct the same heterogeneity analysis for the coworker selection experiment, we find that the referral bonus causes coworkers to refer workers with higher tenure and productivity (Table A.13).

We also conduct heterogeneity analysis a second way, using data from the entire pool of workers who could have been referred, rather than restricting to the sample of referred workers. Note that we do not measure managerial quality for all workers, only for workers who were referred. Nevertheless, this sample allows us to measure whether the referral bonus affects the other characteristics of referred workers that are captured in the firm’s administrative data.

Specifically, we predict the likelihood that a worker is referred by a Control or an Incentivized supervisor based on their observable characteristics and plot the coefficients obtained from this regression in Figure A.2. Descriptively it appears that supervisors in the status quo are more likely to refer workers who end up applying for promotion, male workers, more senior workers, and workers who benefit from past discretion. Holding all else constant, female workers are 4.3 percentage points less likely to be referred by a supervisor (a 138% decrease). This matches survey responses, where for example, 34% of supervisors state they believe men generally make better leaders than women, compared to 16% of supervisors who believe women generally make better leaders, and 50% of supervisors who state gender neutral beliefs. The discretionary portion of a worker’s individual bonus earnings, but not their actual output, also significantly predicts whether a worker is referred by a supervisor in the status quo.

Corresponding to our heterogeneity results above, the referral bonus does not significantly shift the estimated coefficients on these worker attributes in either direction. Incentivized supervisors do not significantly differ from Control supervisors in their likelihood of referring workers who are male or who earn more discretionary bonus.

Incentivized supervisors, however, are more likely to refer more junior workers (p-value of difference in coefficients is 0.061).

We repeat this exercise for the coworker selection experiment and report our results in Figure A.3. Descriptively, in the status quo, coworkers are more likely to refer workers who end up applying for promotion and who have good attendance and are significantly less likely to refer higher productivity workers. Holding all else constant, a one standard deviation increase in productivity reduces the likelihood that a worker is referred by their peers by 4.6 percentage points (a 79% decrease). This pattern is consistent with potential conflicts of interests in the status quo, as workers may have incentives to keep productive peers on their team in order to increase their team bonus earnings. Unlike supervisors, coworkers show no gender preferences in their referrals. The referral bonus makes it more likely that coworkers refer peers with higher productivity (p-value of difference in coefficients is 0.085), consistent with the referral bonus overcoming potential conflicts of interest. Incentivized coworkers are also more likely to refer more senior workers (p-value of difference in coefficients is 0.099).

Taken together, the heterogeneity results suggest that supervisors do not appear to be conflating managerial quality with something else, as the referral bonus significantly changes the measured leadership potential of referred workers but not other characteristics. In contrast with supervisors, the referral bonus causes Incentivized coworkers to refer peers with higher productivity and more seniority. These results are consistent with coworkers believing that work performance in the existing role, rather than managerial quality, are important for identifying higher quality promotion candidates.

6.2 Sorting Experiment: Mechanisms

6.2.1 Heterogeneity Analysis

If higher quality workers are not more or less likely to apply under Discretion, then what types of workers are crowded in, or out, by discretion? Heterogeneity analysis suggests that it is precisely the workers with the highest productivity who are more likely to apply when performance records are emphasized (Table A.14). As shown in Figure A.4, workers in the top quartile of productivity are 43% more likely to apply when performance records are emphasized relative to when supervisor discretion is emphasized. In contrast, other dimensions of applicant performance, including tenure, attendance, and disciplinary issues, do not significantly differ across selection methods.

Analogously, we also examine whether a workers' likelihood of being referred by a supervisor is correlated with their application decisions under different selection methods. We find that workers who are favored by supervisors are not differentially more likely to apply when supervisor selection is emphasized. As shown in Figure A.5 and Panel C of Table A.14, workers who eventually receive a referral from any supervisor are more likely to apply in general, regardless of the selection method, but are not differentially more likely to apply when discretion is emphasized. Similarly, despite the fact that supervisors are more likely to refer male workers, more senior workers, and workers who benefit from past discretion, workers with those characteristics are no more likely to apply when discretionary selection is emphasized.

This heterogeneity helps to explain why discretionary selection does not affect the managerial quality of workers that apply. We see that more productive workers are more likely to apply when performance records are emphasized, while workers who benefit from supervisor selection are not more likely to apply when referrals are emphasized. Since productivity is uncorrelated with managerial quality, and since workers favored by supervisors are not differentially more likely to apply under supervisor selection, it follows that discretion on net has no significant impact on the managerial quality of the applicant pool.

What might be driving these heterogeneity results? Survey results from the second selection round show that workers have relatively accurate beliefs about their performance record but are highly over confident about their managerial quality. In particular, workers were asked to guess specific aspects of their performance record related to their past bonus earnings, attendance, and KPIs, as well as their performance on the managerial test and whether their supervisor would refer them for promotion, all incentivized for accuracy. Survey responses show that 53% of workers accurately guess their past bonus earnings, with 28% guessing more than they earned compared to 19% guessing less than they actually earned (Figure A.6). Workers show similar accuracy in guessing their past attendance and KPIs. In contrast, 82% of workers overestimate their score on the managerial assessment, with 60% of workers overestimating by at least 200% (Figure A.7). Workers are also highly overconfident about supervisor referrals, with 62% of workers guessing that their supervisor will refer them for promotion, and only 34% of workers guessing correctly.

Taken together, these results suggest that workers know their own performance records and more productive workers are more likely to apply when performance records are

emphasized in the selection criteria. In contrast, workers are highly overconfident about their own managerial potential and are inaccurate in guessing supervisor selection, so emphasizing discretionary selection does not crowd in the types of workers actually favored by supervisors.

6.2.2 Sentiment Analysis

To help shed light on potential mechanisms, we also conduct sentiment analysis of supervisors’ and workers’ responses to open-ended questions on the referral and application forms from the selection and sorting experiments respectively.

In particular, we asked supervisors “In your opinion, what are the three most important skills or traits someone should have to succeed as a supervisor at [firm name]?” To extract the most common sentiments from supervisors’ responses to this question, we use the GPT-4o model developed by OpenAI. We first use Google Translate to translate supervisor responses from Swahili to English. We then provided GPT-4o with the translated responses and asked the program to extract the most important “key phrases” from the responses. The results suggests that problem solving, leadership, communication, and discipline are some of the most frequent responses from supervisors, corresponding with soft skills often cited in the management literature.

Correspondingly, we asked workers who applied for promotion to “Please tell us why you are a good candidate for the leadership training program.” We then compare the common sentiments expressed by workers to those of supervisors to their respective open-ended questions. To do so, we first use the key phrases identified by GPT-4o from supervisor responses to formulate target phrases. We then use the *Spacy* package in Python to calculate the cosine similarity between worker and supervisor responses for these chosen phrases. Our results show that while both workers and supervisors cite experience and hard work as important factors, workers are much less likely to mention soft skills, such as managerial ability or communication skills, that supervisors commonly identify as important (Figure A.8). Taken together, the results are consistent with workers preferring promotions to reward existing effort and performance, while supervisors also prioritize match quality when making promotion decisions.

This interpretation also fits with worker survey responses. Specifically, 67% of workers say that performance records should be the most important factor considered when selecting workers for promotion, relative to 19% who prefer the managerial assessment, and 13% who prefer supervisor referrals (Figure A.9). This is not driven by workers who

are disadvantaged by discretion, as the distribution of preferences among workers who were actually referred by supervisors for promotion is nearly identical.

6.3 External Validity

One year after our main experiments, the firm conducted a second selection round to fill the remaining promotions for supervisor openings in the new facility. During this second selection round, we surveyed 116 supervisors across all production departments to elicit their referrals for these new promotion openings. Specifically, we asked supervisors “[Firm name] is planning to promote some line-level workers to supervisors for the new facility opening later this summer. As a current supervisor, you now have the opportunity to refer up to two workers for this promotion opportunity [...] Would you like to refer a worker for the promotion opportunity?” Supervisors were asked to give their referrals verbally to the enumerator during the survey and were informed that their responses would be shared with the firm.

We thus measure supervisor referrals in a high-stakes setting beyond our experimental context. Supervisors face the naturally occurring incentives of their workplace, such as from reputational concerns,⁶ but no additional experimental incentives. These were meaningful decisions. Supervisor referrals were a key consideration in the firm’s actual selection process and 75% of the workers who were eventually promoted in this round were referred by at least one supervisor. Separately, all workers who were interested in the promotion opportunity were invited by the firm to take a new managerial assessment.

In particular, we predict the likelihood that a worker is referred by a supervisor in the second selection round based on their observable characteristics and plot the coefficients obtained from this regression in Figure A.10. We do this both for the entire workforce and for the subset of workers who self-selected into taking the managerial assessment. Since the firm ultimately only considered workers who took the assessment for promotion, we consider the choice of whether to take the test as equivalent to a binding application decision. Thus, for the full sample, we control for whether a worker chose to take the test at all (“applied”), capturing their interest and motivation in pursuing promotion opportunities. Among the sample of applicants, we then control for their actual score on the managerial assessment.

Our results show that managerial quality is a significant predictor of these naturally

⁶Ekinci (2016) shows theoretically how, in a career-concerns model, reputational concerns can provide existing employees with incentives to refer high-quality candidates.

occurring, high-stakes supervisor referrals for promotion, after controlling for observable characteristics and work performance (Figure A.10). A one standard deviation increase in managerial quality is associated with a 25% increase in the probability that a worker is referred by a supervisor. Other predictors of supervisor referrals are remarkably similar to the patterns we observed during our selection experiment. All else equal, supervisors are more likely to refer male workers, more senior workers, and workers with higher discretionary bonus earnings. These results suggest that the referrals we elicited during our selection experiment are representative of how supervisors make promotion decisions more generally in this setting. They also show that supervisors appear to consistently consider managerial quality when making such personnel decisions.

7 Conclusion

Firms often rely on supervisors to make various personnel decisions. Our results show that this can be explained by supervisors having informational advantages. Using a series of field experiments with a large manufacturing firm in Tanzania, we find that discretion crowds in private information that supervisors have about the managerial quality of workers. However, discretion is disliked by workers and reduces the number of workers who apply for promotion opportunities. Nevertheless, our counterfactual analysis shows that overall discretion leads to the promotion of workers with higher managerial quality, even net of its effects on worker self-selection.

Throughout our analysis, we use a written assessment to proxy for managerial quality. While our measure appears to significantly predict supervisor performance in this context, there are likely other aspects of managerial quality that are not captured by this measure. Future research should explore whether supervisors have valuable private information about managerial quality above what can be captured by assessments of skills and traits. Nevertheless, from a policy perspective, our results suggest that firms can bring discretionary decisions more into alignment with firm objectives by credibly announcing and implementing objective measures that proxy for otherwise unobservable qualities that are important to the firm.

More generally, some specific considerations can help guide a firm in how to design its promotion rules. First, is this a context where supervisors likely have informational advantages? Supervisors may have better information if they personally know potential candidates compared to cases where they are making decisions solely based on CVs and written application materials. Second, how similar is the current position to the new

position? The more similar the positions, the better existing information on worker performance will predict performance in the new role.

Finally, how much does the firm care about matching workers to the positions they are best suited versus using promotions as rewards for workers? Our counterfactual analysis focuses solely on the managerial quality of promoted workers. However, in practice, promotions can serve many purposes for a firm. In addition to matching workers to new positions, promotions can also serve as incentives to encourage worker effort in their current roles (Karachiwalla and Park, 2017; Bertrand et al., 2020; Nieddu and Pandolfi, 2022; Deserranno, Kastrau, and Leon-Ciliotta, 2025). This may be an especially important purpose of promotions in contexts that lack performance pay or other direct incentive mechanisms, such as the public sector. As fewer workers are interested in promotions under discretionary selection, it follows that promotions would have an incentive effect on fewer workers under discretionary versus more objective selection criteria. Ultimately, whether a firm should use discretionary promotions will depend on the desired objectives of the promotion.

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Appendices

Appendix A Supplementary Figures and Tables

Table A.1: Summary Statistics

Line-Level Workers	Mean	Median	SD	P5	P95	Obs
Facility: A	0.22	0.00	0.41	0.00	1.00	2366
Facility: B	0.57	1.00	0.49	0.00	1.00	2366
Facility: C	0.21	0.00	0.41	0.00	1.00	2366
Female	0.80	1.00	0.40	0.00	1.00	2364
Muslim	0.45	0.00	0.50	0.00	1.00	2364
Married	0.12	0.00	0.32	0.00	1.00	2364
Age	29.32	28.00	5.67	22.00	40.00	2364
Tenure (Years)	3.29	2.47	2.60	0.19	8.50	2364
Team Size	66.01	63.00	35.12	16.00	167.00	2257
N. Supervisors	3.28	3.00	2.69	1.00	12.00	2366
Output/Target (Avg)	1.00	0.93	0.59	0.14	1.98	1967
Individual Bonus (1000s Tsh)	480.50	360.62	492.77	20.50	1,541.74	2298
Group Bonus (1000s Tsh)	251.42	273.51	221.22	0.00	579.20	2298
Attendance (Days)	220.14	248.00	62.82	60.00	265.00	2344
KPIs	5.53	3.00	8.15	0.00	20.00	2366
Supervisors	Mean	Median	SD	P5	P95	Obs
Facility: A	0.19	0.00	0.39	0.00	1.00	127
Facility: B	0.65	1.00	0.48	0.00	1.00	127
Facility: C	0.16	0.00	0.37	0.00	1.00	127
Female	0.62	1.00	0.49	0.00	1.00	127
Muslim	0.35	0.00	0.48	0.00	1.00	127
Married	0.11	0.00	0.31	0.00	1.00	127
Age	30.59	29.00	5.11	24.00	40.00	127
Tenure (Years)	5.67	6.03	2.76	1.32	10.73	127
Tenure as Supervisor	3.97	4.00	2.69	0.17	8.70	60
N. Teams	1.40	1.00	1.82	1.00	3.00	127
N. Workers	59.80	63.00	43.29	5.00	167.00	126
Education (Years)	10.47	11.00	1.92	7.00	13.00	60

Notes: This table reports the mean, median, standard deviation, 5th percentile, 95th percentile, and number of observations for key descriptive variables of line-level workers and supervisors in the production departments of our partner firm. Facility A, B, C are indicator variables for which facility an employee works in. All demographic variables are calculated using factory administrative data from the month and year of the referrals and applications experiments (June 2023), except for Tenure as Supervisor and Education, which were self-reported in a survey of supervisors conducted one year after the experiments (June 2024), with Tenure as Supervisor scaled to the years of tenure the supervisor would have had at the time of the experiments. Average Output/Target, total bonus earnings (in thousands of Tanzanian shillings), and total attendance (in days) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023).

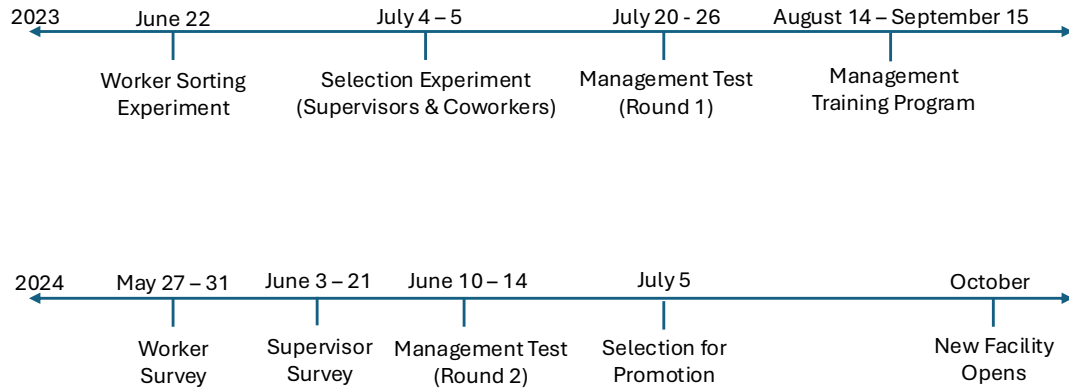


Figure A.1: Study Timeline

Table A.2: Summary of Administrative Data used for Analysis

	Round 1	Round 2
Selection for	Leadership Training Program	Supervisor Positions
Admin data used	May 2022 - June 2023	May 2023 - June 2024
Leadership Test Scores	All workers who apply All workers referred All supervisors	All workers who apply
Demographics	✓	✓
Tenure	✓	✓
Attendance	✓	✓
KPIs	✓	✓
Individual Bonus	✓	✓
Group Bonus	✓	✓
Output/Target	✓	
Discretion in KPIs	December 2022 - May 2022	December 2023 - May 2023
Discretionary Bonus	Percentile of Individual FEs	Individual bonus earnings

Table A.3: Predictors of Measured Managerial Ability

	(1)	(2)	(3)	(4)
	Management Score	Management Score	Management Score	Management Score
	Round 1	Round 2	Pooled	Pooled
Output/Target	0.568 (0.825)			
Individual Bonus	0.925* (0.511)	0.087 (0.397)	0.060 (0.313)	0.206 (0.387)
Group Bonus	1.410 (0.869)	1.021** (0.477)	0.302 (0.397)	0.904* (0.529)
Attendance	-1.260 (1.217)	0.360 (0.898)	1.690** (0.690)	0.727 (0.895)
KPIs	-0.018 (0.099)	-0.109 (0.105)	0.013 (0.071)	0.004 (0.127)
Tenure	-0.774 (0.965)	-0.855 (0.793)	-0.311 (0.647)	-0.361 (0.252)
Tenure ²	-0.001 (0.098)	0.041 (0.072)	-0.032 (0.064)	
Female	-4.583*** (1.634)	-4.926*** (1.164)	-6.072*** (1.066)	-6.827*** (1.767)
Muslim	-0.005 (1.172)	0.198 (0.854)	-0.171 (0.761)	-0.120 (2.107)
Married	-3.809** (1.880)	-0.356 (1.295)	-1.855 (1.229)	-1.604 (1.880)
Mean	47.876	40.214	43.520	43.520
SD	15.225	12.595	14.435	14.435
N	661	871	1,578	1,578
R ²	0.065	0.034	0.045	0.022
F-Test: Work Performance	0.017	0.114	0.003	
F-Test: Demographics	0.006	0.000	0.000	
Model	OLS	OLS	OLS	Non-Parametric Kernel Regression

Notes: This table reports the regression coefficients of various worker characteristics on a worker's overall management test score from the first selection round, second selection round, and both rounds pooled together. Output/Target, Individual Bonus, Group Bonus, and Attendance have been standardized by their mean and standard deviation. Note that data on Output/Target was only available for the first selection round. The model is estimated using OLS in Columns 1-3 and using non-parametric kernel regression in Column 4. Standard errors are reported in parentheses and are clustered at the worker level in Column 3, and bootstrapped standard errors are reported in Column 4. The p-values from F-tests of joint significance of work performance variables (Output/Target, Individual Bonus, Group Bonus, Attendance, KPIs, Tenure, Tenure²) and demographic variables (Female, Muslim, Married) are reported. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.4: Balance Table - Supervisor Selection Experiment Treatment Assignment

	Control		Incentivized		
	N	Mean	N	Mean	P-Value
Panel A: Demographics					
Female	56	0.61	58	0.57	0.682
Muslim	56	0.41	58	0.38	0.734
Married	56	0.14	58	0.07	0.202
Age	56	30.39	58	30.33	0.950
Panel B: Work Characteristics					
Facility: A	58	0.17	60	0.18	0.878
Facility: B	58	0.59	60	0.55	0.694
Facility: C	58	0.21	60	0.23	0.732
Tenure (Years)	56	5.63	58	5.80	0.744
Attendance (Days)	56	250.70	58	248.40	0.640
KPIs	56	3.00	60	2.68	0.684
Bonus Earnings (1000s Tsh)	56	1,521.90	58	1,695.64	0.207

Notes: This table reports the average values of observable characteristics of supervisors randomly assigned to the Control and Incentivized groups, as well as the p-value from the two-sided hypothesis test of equality of sample means. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.5: Balance Table - Attrition of Workers Referred by Supervisors

	Referred N = 228	Matched Roster N = 188	Not Matched N = 40	Took Test N = 161	Attrition N = 67	P-Value Matched/Not Matched	P-Value Took Test/Attrition
Panel A: Supervisor Referral Experiment							
Treatment Assignment	0.51 (0.50)	0.51 (0.50)	0.55 (0.50)	0.50 (0.50)	0.54 (0.50)	0.61	0.64
Panel B: Demographics							
Female	0.66 (0.48)	0.66 (0.48)		0.66 (0.47)	0.62 (0.50)		0.63
Muslim	0.41 (0.49)	0.41 (0.49)		0.40 (0.49)	0.46 (0.51)		0.54
Married	0.11 (0.32)	0.11 (0.32)		0.11 (0.31)	0.15 (0.37)		0.47
Age	29.51 (5.54)	29.51 (5.54)		29.67 (5.68)	28.50 (4.53)		0.32
Panel C: Work Performance							
Facility: A	0.18 (0.38)	0.21 (0.41)		0.21 (0.41)	0.09 (0.29)		0.03**
Facility: B	0.46 (0.50)	0.56 (0.50)		0.55 (0.50)	0.25 (0.44)		0.00***
Facility: C	0.17 (0.38)	0.21 (0.41)		0.23 (0.42)	0.03 (0.17)		0.00***
Tenure (Years)	4.12 (2.55)	4.12 (2.55)		4.10 (2.50)	4.24 (2.88)		0.79
Output/Target (Avg)	0.97 (0.66)	0.97 (0.66)		0.93 (0.52)	1.20 (1.18)		0.07
Attendance (Days)	241.26 (39.15)	241.26 (39.15)		243.64 (37.88)	226.50 (44.19)		0.04**
KPIs	3.69 (5.11)	4.47 (5.31)		4.44 (5.15)	1.88 (4.58)		0.00**
Individual Bonus (1000s Tsh)	705.26 (717.41)	705.26 (717.41)		731.51 (740.12)	546.78 (546.17)		0.22
Group Bonus (1000s Tsh)	323.61 (315.93)	323.61 (315.93)		325.80 (332.00)	310.37 (196.47)		0.82
Panel D: Supervisor Discretion							
Discretion in KPIs	1.10 (2.15)	1.33 (2.30)		1.20 (1.84)	0.85 (2.74)		0.27
Discretionary Bonus (Percentile FEs)	55.25 (29.04)	55.25 (29.04)		56.10 (29.38)	50.11 (27.15)		0.42
RefMatch Gender	0.71 (0.46)	0.71 (0.46)		0.71 (0.46)	0.71 (0.46)		0.97
RefMatch Religion	0.54 (0.50)	0.54 (0.50)		0.54 (0.50)	0.54 (0.51)		0.98

Notes: This table reports the average values and standard deviations in parentheses of observable characteristics of workers who were referred by a supervisor, and among those who were referred, who could versus could not be matched to a current employee at the factory, and who did versus did not take the management test. N reports the number of referrals, not the number of unique workers, and note that there were 22 workers who were referred by more than one supervisor. The p-values from the two-sided hypothesis tests of equality of sample means between referrals that were matched and not matched to a current employee, and between referrals that took versus did not take the test, are reported. Treatment Assignment is an indicator variable for whether the referring supervisor was randomly assigned to the Incentivized treatment. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion are indicator variables for whether a worker shares the same gender or religion as the referring supervisor. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.6: Balance Table - Selection of Coworker Sample

	Not Selected (N = 827)	Selected (N = 291)	P-Value Selection	Did Not Participate (N = 57)	Participated (N = 237)	P-Value Participation
Panel A: Application Experiment						
Application Treatment	0.50 (0.50)	0.49 (0.50)	0.73	0.47 (0.50)	0.50 (0.50)	0.74
Applied	0.52 (0.50)	0.55 (0.50)	0.35	0.58 (0.50)	0.55 (0.50)	0.68
Panel B: Demographics						
Female	0.84 (0.36)	0.88 (0.32)	0.10	0.84 (0.37)	0.89 (0.31)	0.28
Muslim	0.46 (0.50)	0.42 (0.49)	0.26	0.44 (0.50)	0.42 (0.49)	0.77
Married	0.11 (0.32)	0.09 (0.29)	0.37	0.19 (0.40)	0.07 (0.25)	0.00***
Age	29.34 (5.52)	29.78 (6.23)	0.25	30.21 (6.27)	29.66 (6.22)	0.55
Panel B: Work Performance						
Facility: A	0.28 (0.45)	0.27 (0.45)	0.75	0.18 (0.38)	0.30 (0.46)	0.06*
Facility: B	0.72 (0.45)	0.73 (0.45)	0.75	0.82 (0.38)	0.70 (0.46)	0.06*
Tenure (Years)	3.35 (2.61)	3.30 (2.54)	0.78	3.40 (2.41)	3.28 (2.57)	0.74
Output/Target (Avg)	0.93 (0.38)	0.92 (0.31)	0.64	0.95 (0.20)	0.91 (0.33)	0.43
Attendance (Days)	225.94 (58.25)	228.19 (56.04)	0.57	226.16 (46.34)	228.74 (58.09)	0.76
KPIs	4.31 (6.03)	3.91 (4.56)	0.30	5.58 (5.80)	3.51 (4.12)	0.00***
Individual Bonus (1000s Tsh)	450.29 (545.32)	436.70 (484.46)	0.71	594.84 (622.65)	399.35 (436.87)	0.01**
Group Bonus (1000s Tsh)	368.23 (172.36)	360.72 (167.35)	0.52	323.40 (152.80)	370.55 (169.78)	0.06*
Panel C: Supervisor Discretion						
Discretion in KPIs	1.05 (2.67)	1.23 (2.51)	0.31	1.33 (3.44)	1.19 (2.23)	0.70
Discretionary Bonus (Percentile FEs)	46.33 (30.19)	45.07 (29.68)	0.55	53.53 (31.05)	43.32 (29.15)	0.03**
SupMatch Gender	0.65 (0.35)	0.68 (0.33)	0.20	0.63 (0.26)	0.70 (0.34)	0.18
SupMatch Religion	0.50 (0.32)	0.54 (0.30)	0.13	0.47 (0.32)	0.55 (0.29)	0.05*

Notes: This table reports the average values and standard deviations in parentheses of observable characteristics of the workers randomly selected and not selected for the Coworker Referral Experiment and, among those that were selected, the workers who choose to participate versus not participate. The p-values from the two-sided hypothesis tests of equality of sample means between those selected versus not selected, and between those that participated and did not participate, are reported. Application Treatment is an indicator variable for whether the worker was randomly assigned to the Discretionary treatment in the Worker Sorting Experiment. Applied is an indicator variable for whether the worker themselves applied for promotion. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion are indicator variables for whether a worker shares the same gender or religion as the referring supervisor.*p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.7: Balance Table - Coworker Selection Experiment Treatment Assignment

	Control (N = 114)	Treatment (N = 123)	P-Value Control/Treat
Panel A: Demographics			
Female	0.88 (0.33)	0.91 (0.29)	0.41
Muslim	0.40 (0.49)	0.43 (0.50)	0.67
Married	0.07 (0.26)	0.07 (0.26)	0.93
Age	29.46 (6.55)	29.85 (5.87)	0.63
Panel B: Work Performance			
Facility: A	0.31 (0.46)	0.29 (0.46)	0.81
Facility: B	0.69 (0.46)	0.71 (0.46)	0.81
Tenure (Years)	3.41 (2.65)	3.21 (2.52)	0.55
Output/Target (Avg)	0.89 (0.25)	0.94 (0.39)	0.24
Attendance (Days)	230.01 (57.73)	227.98 (58.26)	0.79
KPIs	3.18 (3.65)	3.90 (4.57)	0.18
Individual Bonus (1000s Tsh)	368.22 (459.76)	425.78 (410.88)	0.31
Group Bonus (1000s Tsh)	368.79 (165.47)	374.25 (174.28)	0.81
Panel C: Supervisor Discretion			
Discretion in KPIs	1.01 (2.05)	1.33 (2.39)	0.28
Discretionary Bonus (Percentile FEs)	42.90 (27.56)	43.58 (30.45)	0.86
SupMatch Gender	0.68 (0.36)	0.70 (0.33)	0.62
SupMatch Religion	0.57 (0.30)	0.52 (0.28)	0.18

Notes: This table reports the average values and standard deviations in parentheses of observable characteristics of coworkers who were randomly assigned to the Control and Treatment groups of the Coworker Selection Experiment. The p-value from the two-sided hypothesis test of equality of sample means between Control and Treatment coworkers is reported. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion are indicator variables for whether a worker shares the same gender or religion as the referring supervisor.*p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.8: Balance Table - Attrition of Workers Referred by Coworkers

	Referred N = 448	Matched Roster N = 357	Not Matched N = 91	Took Test N = 308	Attrition N = 140	P-Value Matched/Not Matched	P-Value Took Test/Attrition
Panel A: Coworker Referral Experiment							
Treatment Assignment	0.53 (0.50)	0.54 (0.50)	0.50 (0.50)	0.55 (0.50)	0.49 (0.50)	0.52	0.24
Panel B: Demographics							
Female	0.85 (0.35)	0.85 (0.35)		0.87 (0.34)	0.77 (0.42)		0.08
Muslim	0.44 (0.50)	0.44 (0.50)		0.44 (0.50)	0.46 (0.50)		0.76
Married	0.10 (0.31)	0.10 (0.31)		0.10 (0.30)	0.15 (0.36)		0.31
Age	29.23 (5.27)	29.23 (5.27)		29.08 (5.21)	30.21 (5.59)		0.17
Panel C: Work Performance							
Facility: A	0.23 (0.42)	0.29 (0.45)		0.29 (0.45)	0.11 (0.31)		0.00
Facility: B	0.55 (0.50)	0.70 (0.46)		0.71 (0.46)	0.22 (0.42)		0.00
Facility: C	0.01 (0.08)	0.01 (0.09)		0.01 (0.08)	0.01 (0.08)		0.94
Tenure (Years)	3.60 (2.64)	3.60 (2.64)		3.45 (2.57)	4.57 (2.91)		0.01
Output/Target (Avg)	0.92 (0.40)	0.92 (0.40)		0.92 (0.41)	0.94 (0.31)		0.82
Attendance (Days)	229.63 (56.22)	229.63 (56.22)		229.31 (57.49)	231.74 (47.51)		0.78
KPIs	3.21 (4.94)	4.02 (5.23)		3.83 (5.06)	1.83 (4.38)		0.00
Individual Bonus (1000s Tsh)	481.83 (544.72)	481.83 (544.72)		468.67 (530.73)	566.99 (627.46)		0.25
Group Bonus (1000s Tsh)	373.78 (169.30)	373.78 (169.30)		378.09 (165.76)	345.87 (190.23)		0.23
Panel D: Discretion							
RefMatch Gender	0.85 (0.36)	0.85 (0.36)		0.86 (0.35)	0.81 (0.39)		0.42
RefMatch Religion	0.55 (0.50)	0.55 (0.50)		0.57 (0.50)	0.42 (0.50)		0.04
Discretion in KPIs	0.85 (2.42)	1.07 (2.67)		1.13 (2.50)	0.24 (2.11)		0.00
Discretionary Bonus (Percentile FEs)	47.31 (28.64)	47.31 (28.64)		47.23 (28.58)	47.94 (29.56)		0.89

Notes: This table reports the average values and standard deviations in parentheses of observable characteristics of workers who were referred by a coworker, and among those who were referred, who could versus could not be matched to a current employee at the factory, and who did versus did not take the management test. N reports the number of referrals, not the number of unique workers, and note that there were 70 workers who were referred by more than one coworker. The p-values from the two-sided hypothesis tests of equality of sample means between referrals that were matched and not matched to a current employee, and between referrals that took versus did not take the test, are reported. Treatment Assignment is an indicator variable for whether the referring coworker was randomly assigned to the Incentivized treatment. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion are indicator variables for whether a worker shares the same gender or religion as the referring coworker.*p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.9: Balance Table - Applications Experiment Treatment Assignment

	Control (N = 559)	Treatment (N = 559)	P-Value Control/Treat
Panel A: Demographics			
Female	0.85 (0.36)	0.86 (0.35)	0.58
Muslim	0.43 (0.50)	0.47 (0.50)	0.13
Married	0.11 (0.31)	0.10 (0.30)	0.72
Age	29.29 (5.45)	29.62 (5.97)	0.33
Panel B: Work Performance			
Facility: A	0.28 (0.45)	0.28 (0.45)	0.85
Facility: B	0.72 (0.45)	0.72 (0.45)	0.85
Tenure (Years)	3.22 (2.45)	3.46 (2.72)	0.12
Output/Target (Avg)	0.97 (0.37)	0.97 (0.40)	0.94
Attendance (Days)	225.93 (58.43)	227.14 (56.92)	0.73
KPIs	4.23 (5.78)	4.18 (5.60)	0.88
Individual Bonus (1000s Tsh)	443.08 (508.44)	450.34 (550.78)	0.82
Group Bonus (1000s Tsh)	365.69 (174.72)	366.81 (167.34)	0.91
Panel C: Supervisor Discretion			
Discretion in KPIs	1.50 (2.92)	1.39 (2.71)	0.54
Discretionary Bonus (Percentile FEs)	45.41 (30.03)	46.58 (30.08)	0.54
SupMatch Gender	0.65 (0.35)	0.67 (0.34)	0.26
SupMatch Religion	0.50 (0.31)	0.52 (0.32)	0.42

Notes: This table reports the average values and standard deviations in parentheses of observable characteristics of workers randomly assigned to the Control and Discretionary groups in the Worker Sorting Experiment. P-values from two-sided hypothesis tests of equality of sample means are also reported. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. SupMatch Gender and SupMatch Religion measure the average degree of matching between a worker's gender and religion and those of their supervisors. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.10: Balance Table - Applications Experiment Attrition

	Apply = 1 (N = 592)		Took Test (N = 502)		Attrition (N = 90)		P-Value
	Mean	Sd	Mean	Sd	Mean	Sd	Took Test/Attrition
Panel A: Application Experiment							
Treatment Assignment	0.47	0.50	0.46	0.50	0.52	0.50	0.28
Panel B: Demographics							
Female	0.82	0.39	0.81	0.39	0.83	0.38	0.81
Muslim	0.43	0.50	0.42	0.49	0.47	0.50	0.48
Married	0.12	0.32	0.12	0.32	0.12	0.32	0.93
Age	29.32	5.78	29.30	5.75	29.45	6.00	0.82
Panel C: Work Performance							
Facility: A	0.25	0.44	0.26	0.44	0.23	0.42	0.63
Facility: B	0.75	0.44	0.74	0.44	0.77	0.42	0.63
Tenure (Years)	3.14	2.51	3.07	2.45	3.54	2.83	0.11
Output/Target (Avg)	0.98	0.41	0.99	0.43	0.96	0.28	0.53
Attendance (Days)	224.39	59.61	226.71	58.42	210.57	64.90	0.02**
KPIs	4.04	5.33	3.72	4.70	5.87	7.78	0.00***
Individual Bonus (1000s Tsh)	456.38	518.90	452.97	516.08	477.09	538.56	0.70
Group Bonus (1000s Tsh)	360.15	169.58	366.83	167.93	319.51	174.92	0.02**
Panel D: Supervisor Discretion							
Discretion in KPIs	1.48	2.62	1.48	2.35	1.48	3.78	1.00
Discretionary Bonus (Percentile FEs)	46.41	30.21	46.62	30.16	45.01	30.77	0.68
SupMatch Gender	0.65	0.34	0.65	0.33	0.63	0.38	0.62
SupMatch Religion	0.52	0.31	0.52	0.31	0.49	0.33	0.38

Notes: This table reports the average values and standard deviations of observable characteristics of workers who applied for the training, workers that applied and took the test, and workers that applied but did not take the test (attrition). The p-values from the two-sided hypothesis tests of equality of sample means between workers who applied and took the test and workers who applied and did not take the test are reported. Treatment Assignment is an indicator variable for whether a worker was randomly assigned to the Discretionary treatment in the Worker Sorting Experiment. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Facility A, B, C are indicator variables for which facility an employee works in. Age and tenure are measured in years. Total attendance (in days) and bonus earnings (in thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. SupMatch Gender and SupMatch Religion measure the average degree of matching between a worker's gender and religion and those of their supervisors. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.11: Effect of Supervisor's Own Managerial Quality on Referrals

	(1)	(2)	(3)	(4)
	Total Score	Production Score	Traits Score	Logic Score
Incentivized Supervisor Referral	7.349** (2.876)	2.710 (1.677)	3.538*** (1.181)	1.942** (0.881)
Supervisor's Score	0.274** (0.120)	0.668*** (0.082)	-0.059 (0.113)	0.218*** (0.077)
Control Mean	45.763	29.100	9.787	6.875
Control SD	17.071	10.507	6.031	5.583
Supervisor Controls	✓	✓	✓	✓
N Referrals	135	135	135	135

Notes: This table reports the effects of randomized referral incentives and a supervisor's own managerial test scores on the managerial quality of the workers referred by supervisors. Quality is measured by a worker's score on a management test, including the total score and the score on each sub-section of the test. Supervisor's Score refers to the supervisor's score on the overall test in column (1), on the production sub-section of the test in column (2), on the traits sub-section of the test in column (3), and on the logic sub-section of the test in column (4). Supervisor controls, including the supervisor's gender, religion, tenure, and marital status, are included in all regressions. Standard errors are clustered by supervisor. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.12: Supervisor Selection Experiment: Heterogeneity Analysis

Panel A: Demographics	(1)	(2)	(3)		
	Female	Muslim	Married		
Incentivized Supervisor Referral	-0.060 (0.068)	0.090 (0.079)	-0.048 (0.041)		
Control Mean	0.696	0.359	0.141		
Control SD	0.463	0.482	0.350		
Supervisor Controls	✓	✓	✓		
N Referrals	187	187	187		
Panel B: Work Performance	(1)	(2)	(3)	(4)	(5)
	Output/Target	Individual Bonus	Attendance	KPIs	Tenure
Incentivized Supervisor Referral	-0.046 (0.114)	-0.001 (1.206)	-3.994 (6.282)	-0.439 (0.666)	-0.280 (0.397)
Control Mean	0.981	6.920	243.130	4.009	4.193
Control SD	0.695	7.469	32.110	5.878	2.572
Supervisor Controls	✓	✓	✓	✓	✓
N Referrals	155	183	187	228	187
Panel C: Discretion	(1)	(2)	(3)	(4)	
	RefMatch Gender	RefMatch Religion	Discretionary Bonus	Discretion in KPIs	
Incentivized Supervisor Referral	0.043 (0.068)	-0.132* (0.079)	-1.458 (6.171)	0.103 (0.320)	
Control Mean	0.685	0.598	56.603	1.054	
Control SD	0.467	0.493	29.359	2.199	
N Referrals	187	187	127	228	
Supervisor Controls	✓	✓	✓	✓	

Notes: This table reports the effects of randomized referral incentives on the average characteristics of the workers referred by supervisors. The omitted category in all specifications is Control supervisor referrals. Supervisor controls, including the supervisor's gender, religion, tenure, and marital status, are included in all regressions. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Tenure is measured in years. Total attendance (in days) and bonus earnings (in hundreds of thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion measure the degree of matching between a worker's gender and religion and those of the referring supervisor. Standard errors are clustered by supervisor. *p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.13: Coworker Selection Experiment: Heterogeneity Analysis

Panel A: Demographics					
	(1) Female	(2) Muslim	(3) Married		
Incentivized Coworker Referral	0.040 (0.038)	-0.043 (0.056)	-0.004 (0.034)		
Control Mean	0.818	0.448	0.103		
Control SD	0.387	0.499	0.305		
Coworker Controls	✓	✓	✓		
N Referrals	356	356	356		
Panel B: Work Performance					
	(1) Output/Target	(2) Individual Bonus	(3) Attendance	(4) KPIs	(5) Tenure
Incentivized Coworker Referral	0.086* (0.046)	0.297 (0.608)	0.869 (6.321)	0.273 (0.482)	0.628** (0.242)
Control Mean	0.882	4.809	231.366	3.052	3.434
Control SD	0.231	5.787	53.298	5.014	2.595
Coworker Controls	✓	✓	✓	✓	✓
N Referrals	336	351	355	448	356
Panel C: Favoritism					
	(1) RefMatch Gender	(2) RefMatch Religion	(3) Discretionary Bonus	(4) Discretion in KPIs	
Incentivized Coworker Referral	0.014 (0.038)	0.062 (0.056)	0.697 (3.656)	0.190 (0.244)	
Control Mean	0.830	0.533	47.760	0.730	
Control SD	0.377	0.500	27.891	2.667	
Coworker Controls	✓	✓	✓	✓	
N Referred Workers	356	356	325	448	

Notes: This table reports the effects of randomized referral incentives on the average characteristics of the workers referred by coworkers. The omitted category in all specifications is Control coworker referrals. Coworker controls, including the coworker's gender, religion, tenure, and marital status, are included in all regressions. Standard errors are clustered by coworker. Female, Muslim, and Married are indicator variables corresponding to demographic characteristics. Tenure is measured in years. Total attendance (in days) and bonus earnings (in hundreds of thousands of Tanzanian shillings) are calculated for the year prior to the experiment (May 2022 - May 2023). Key Performance Indicators (KPIs), in line with factory practice, are calculated for the nine months preceding the experiment (October 2022 - May 2023). Discretion in KPIs and Bonus measure the extent to which a worker experienced past beneficial discretion, as described in Appendix B. RefMatch Gender and RefMatch Religion measure the degree of matching between a worker's gender and religion and those of the referring coworker. Standard errors are clustered by coworker. *p < 0.1, ** p < 0.05, *** p < 0.01.

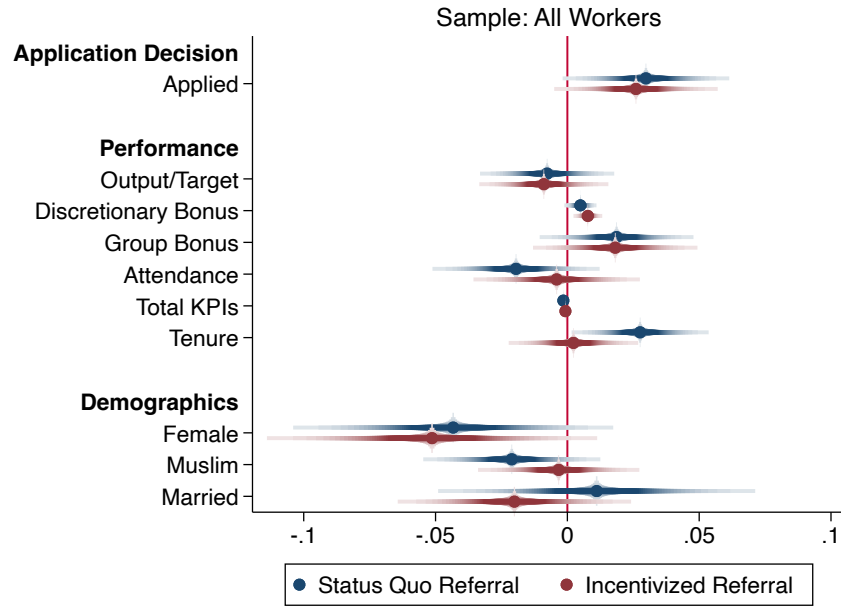


Figure A.2: Descriptive Predictors of Supervisor Referrals

Notes: This figure plots the estimated coefficients from regressions predicting the likelihood that a worker is referred by a Control or an Incentivized supervisor based on their observable characteristics. Continuous variables have been standardized by their mean and standard deviation. Smoothed confidence intervals with robust standard errors for each estimated coefficient are reported, with 50 equally spaced confidence levels where levels are placed in steps of 2 from 1 to 99.

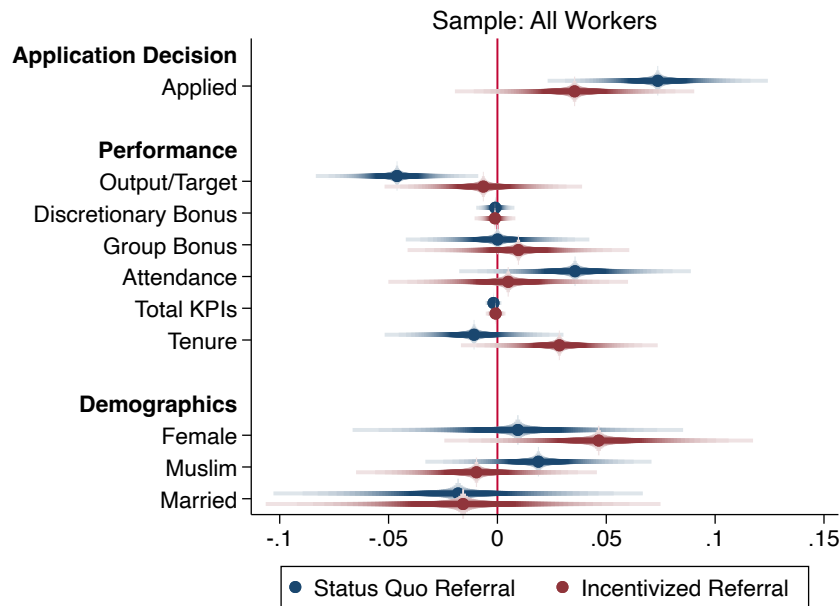


Figure A.3: Descriptive Predictors of Coworker Referrals

Notes: This figure plots the estimated coefficients from regressions predicting the likelihood that a worker is referred by a Control or an Incentivized coworker based on their observable characteristics. Continuous variables have been standardized by their mean and standard deviation. Smoothed confidence intervals with robust standard errors for each estimated coefficient are reported, with 50 equally spaced confidence levels where levels are placed in steps of 2 from 1 to 99.

Table A.14: Sorting Experiment: Heterogeneous Treatment Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied	Applied
Discretionary Application	-0.067** (0.031)	-0.066** (0.031)	-0.062** (0.031)	-0.064** (0.031)	-0.037 (0.038)	-0.021 (0.051)	-0.056* (0.034)	-0.041 (0.042)	-0.056* (0.033)	-0.056* (0.033)	-0.041 (0.067)	-0.055 (0.034)	0.062 (0.090)
Panel A: Work Performance													
Treat X Output	-0.108*** (0.033)												-0.106*** (0.034)
Treat X Indv Bonus		-0.028 (0.030)											0.001 (0.033)
Treat X Group Bonus			-0.061* (0.033)										-0.051 (0.042)
Treat X Attend				-0.045 (0.032)									0.000 (0.044)
Treat X KPIs					-0.007 (0.005)								-0.007 (0.006)
Treat X Tenure						-0.014 (0.012)							-0.009 (0.014)
Panel B: Demographics													
Treat X Male							-0.073 (0.086)						-0.081 (0.089)
Treat X Muslim								-0.059 (0.062)					-0.053 (0.063)
Treat X Married									-0.106 (0.100)				-0.120 (0.102)
Panel C: Supervisor Discretion													
Treat X Referred										-0.136 (0.099)			-0.121 (0.101)
Treat X Disc Bonus											-0.005 (0.011)		0.000 (0.011)
Treat X Disc KPI												-0.012 (0.013)	-0.009 (0.013)
Control Mean	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562
Control SD	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.497
Worker Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022

Notes: This table reports heterogeneous treatment effects of Discretionary applications on whether a worker applies for promotion by various worker characteristics, including work performance variables in Panel A, worker demographics in panel B, and a worker's experience of supervisor discretion in Panel C. Worker controls include work performance in the prior year (output/target, individual bonus, group bonus, attendance, KPIs, and tenure), demographics (gender, religion, and marital status), and experiences of supervisor discretion (whether the worker eventually receives a referral from any supervisor for promotion, and the extent to which a worker experiences beneficial discretion in individual bonus pay and KPIs, as described in Appendix B). Continuous variables have been standardized by their mean and standard deviation. Robust standard errors are reported in parentheses. *p < 0.1, ** p < 0.05, *** p < 0.01.

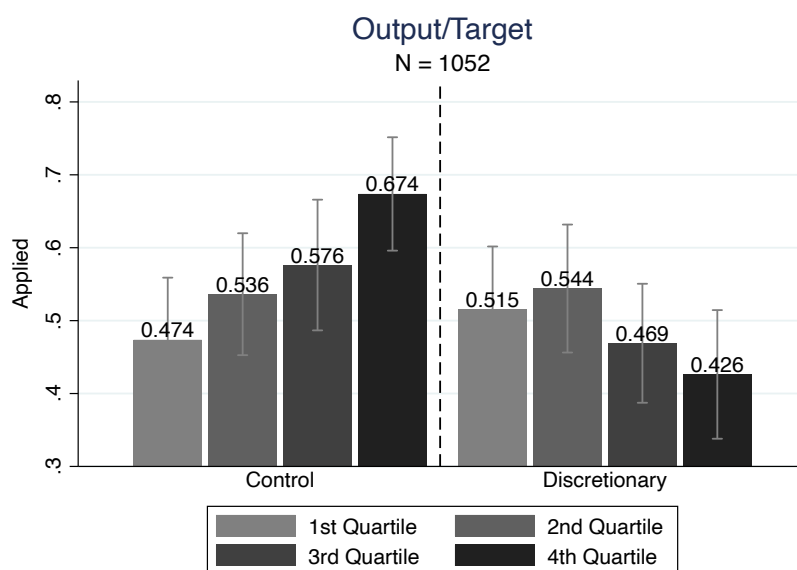


Figure A.4: Application Rates by Productivity

Notes: This figure illustrates the average application rates across Control and Discretionary application forms by quartiles of worker output, scaled to task-specific performance targets, with higher quartiles representing better performance. Output/Target is calculated as the average output/target for the year prior to the experiment (May 2022 - May 2023). 95% confidence intervals are displayed.

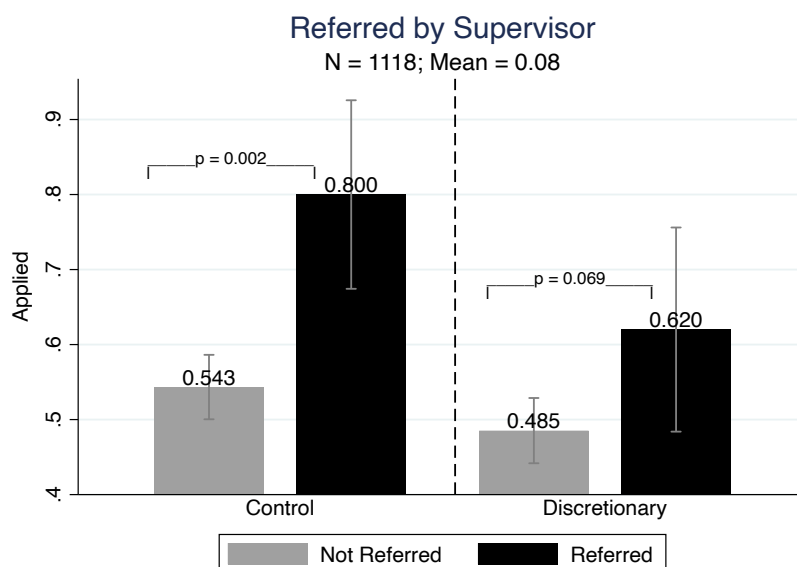


Figure A.5: Application Rates by Referral Status

Notes: This figure illustrates the average application rates across Control and Discretionary application forms by whether a worker received a referral from any supervisor. 95% confidence intervals are displayed. P-values from tests of difference in means in application rates between workers who were referred versus not referred by any supervisor are reported.

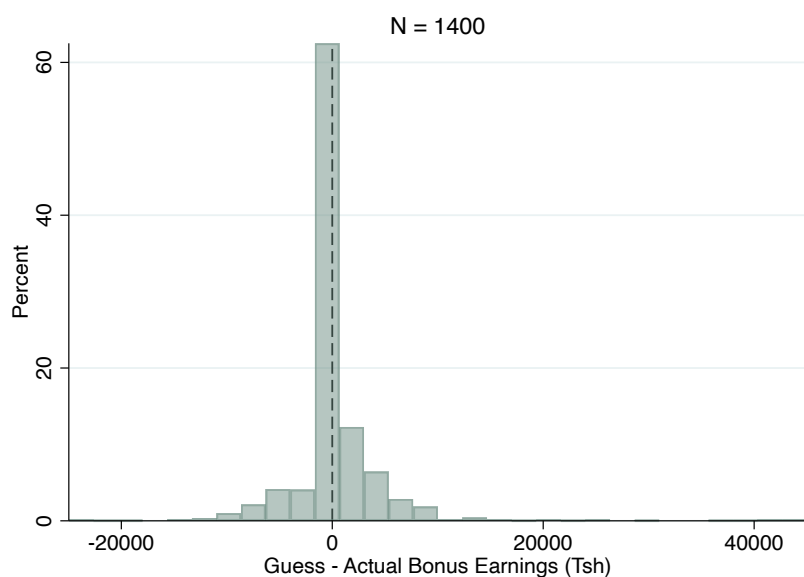


Figure A.6: Worker Beliefs about Bonus Earnings

Notes: In the worker opinion survey, workers were asked to guess (incentivized for accuracy) how much total bonus pay they received in the past week. This figure reports the difference between each respondent's guess and the actual amount of bonus pay they received in Tanzanian Shillings. Values greater than zero indicate overconfidence.

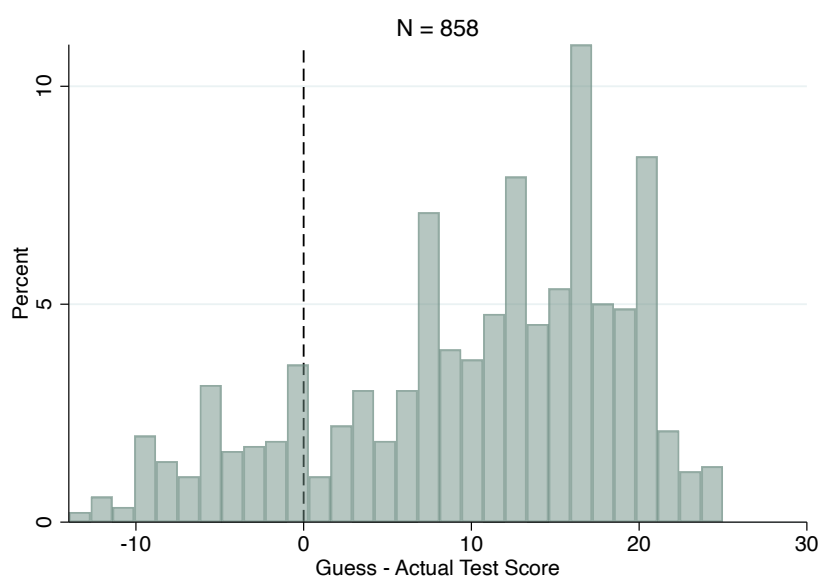


Figure A.7: Worker Beliefs about Own Managerial Ability

Notes: In the worker opinion survey, workers were asked to guess (incentivized for accuracy) how many of the 26 technical questions they answered correctly on the management test. This figure reports the distribution of the difference between each respondent's guess and the actual number of questions they answered correctly. Values greater than zero indicate overconfidence.

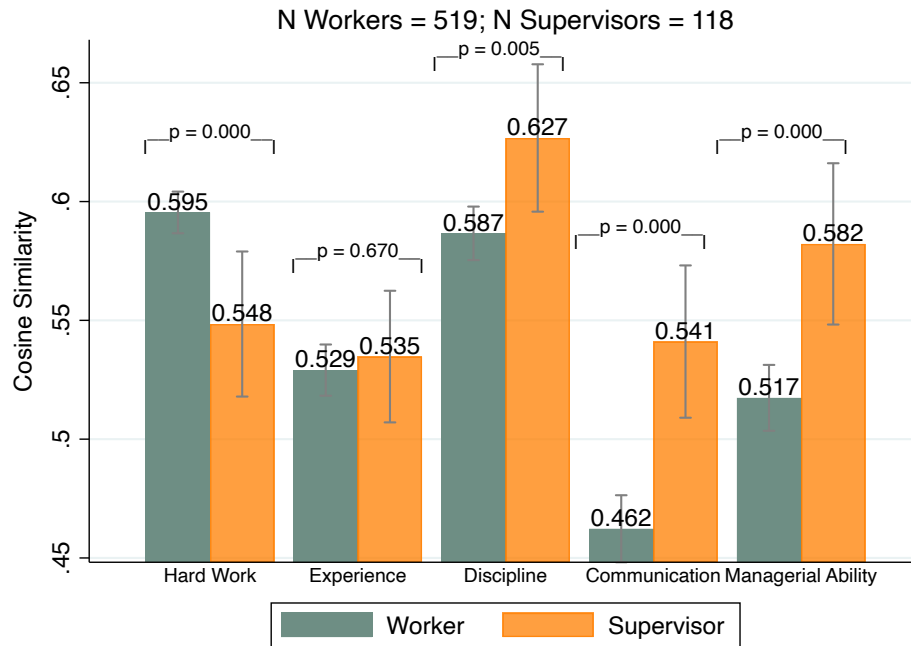


Figure A.8: Sentiment Analysis of Worker versus Supervisor Responses

Notes: This figure illustrates the cosine similarity between worker responses to the question “Please tell us why you are a good candidate for the leadership training program,” and supervisor responses to the question “In your opinion, what are the three most important skills or traits someone should have to succeed as a supervisor at [firm name]?” for a list of target phrases identified from sentiment analysis of supervisor responses. P-values from tests of differences in means between worker and supervisor responses for each target phrase are displayed.

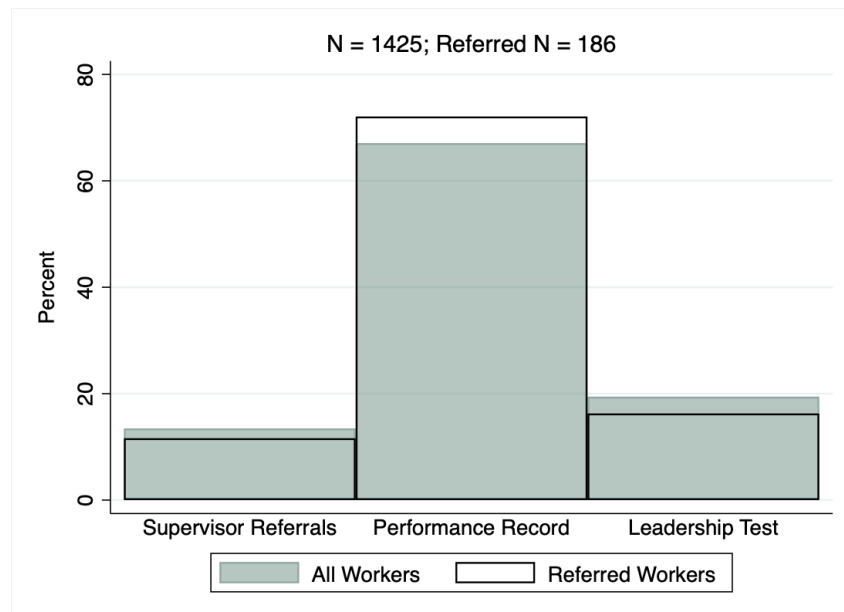


Figure A.9: Worker Preferences over Promotion Selection Criteria

Notes: This figure illustrates the distribution of survey responses to the question “Which do you think should be the MOST important factor considered when selecting workers for promotion?” from the worker opinion survey.

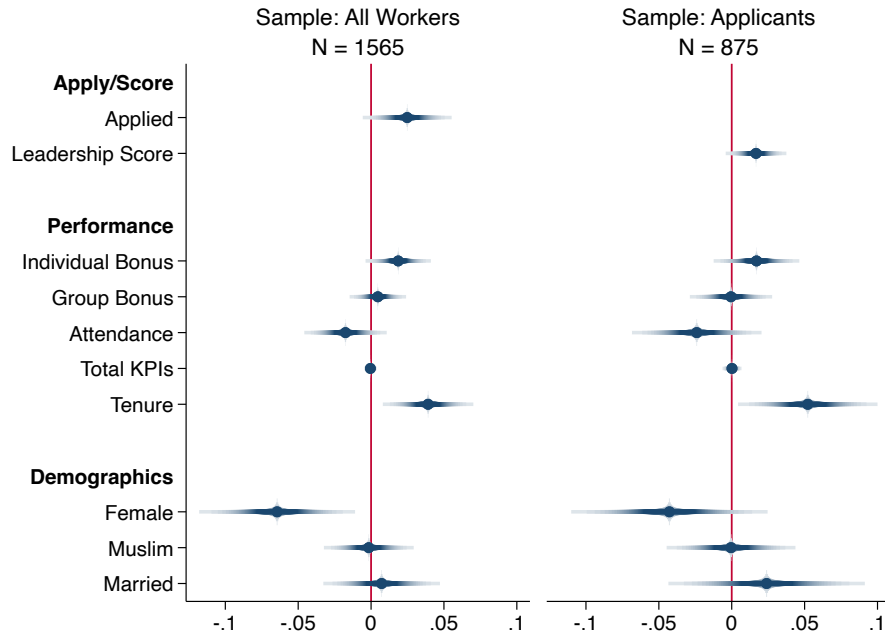


Figure A.10: Predictors of Second Round Supervisor Referrals

Notes: This figure plots the estimated coefficients from regressions predicting the likelihood that a worker is referred by a supervisor in the second selection round for either the entire sample of workers or for the sub-sample of workers who applied for promotion. Smoothed confidence intervals for each estimated coefficient are reported, with 50 equally spaced confidence levels where levels are placed in steps of 2 from 1 to 99.

Appendix B Measuring Supervisor Discretion

Supervisor discretion is a regular part of a worker's experience on the job. Many status quo decisions in the factory rely on supervisor discretion, including a variety of personnel decisions. The factory relies almost solely on supervisors to choose which workers to hire, allocate workers to tasks, and select workers for promotion. While the factory has some rules-based procedures for how to reward worker effort and discipline shirking, supervisors also have some discretion in these domains.

Throughout our analysis, we use two measures to capture the extent that workers experience beneficial supervisor discretion across various workplace domains. The first measure, "Discretion in KPIs," captures how much workers benefit from supervisor discretion in tracking Key Performance Indicators (KPIs). KPIs include late arrivals, unexcused absences, permission leave, sick leave, and warning letters from breaking the firm's rules and policies. When making important personnel decisions, the factory will often take into consideration a worker's KPIs from the past nine months. Late arrivals, unexcused absences, and warning letters are particularly serious and can potentially result in terminations.

Three KPIs are attendance-related and can therefore be verified against the raw daily attendance record. This reveals significant discrepancies. Systematically fewer KPIs

are reported relative to the actual attendance data for issues that have more severe consequences for workers, particularly late arrivals and unexcused absences (Figure B.11). These patterns suggest supervisors exercise at least some discretion in how they choose to discipline workers, beyond just mistakes or measurement errors that would affect all attendance-related KPIs. To measure discretion in KPIs, we subtract the number of attendance-related KPIs from the actual number of corresponding issues recorded in a worker’s daily attendance record in the nine months prior to each selection round (Equation B.1). A positive value in this measure indicates that a worker benefits favorably from supervisor discretion in their KPIs.

$$KPIDiscretion_i = AttendanceIssues_i - AttendanceKPIs_i \quad (B.1)$$

We also measure supervisor discretion in the allocation of individual performance bonuses. Workers earn performance bonuses based on their individual output. Most tasks have their own bonus schedule, where workers earn a set bonus amount if they meet the daily production target for their task, as well as a piece rate bonus for additional units they produce above their target. However, supervisors also allocate additional individual bonuses to workers at their discretion, purportedly to motivate workers to reach their team-level targets. Comparing the actual amount of individual bonus that a worker earns to the rules-based amount of bonus they should have earned reveals that such discretionary bonuses appear to be widespread (Figure B.12). In the year prior to the study, workers appear to earn positive discretionary bonuses approximately 67% of the time, earning exactly the rules based amount 27% of the time, and earning less than the rules based amount around 6% of the time.

To construct our measure of “Discretionary Bonus” we first estimate the following:

$$ActualBonus_{it} - RulesBasedBonus_{it} = \delta_i + \gamma_t + \varepsilon_{it} \quad (B.2)$$

where $ActualBonus_{it}$ is the amount of individual bonus worker i actually receives for week t ; $RulesBasedBonus_{it}$ is the amount of individual bonus worker i should have earned in week t based on their output and the bonus schedule for their task; δ_i are worker fixed effects; and γ_t are week fixed effects. We then use the percentile of the estimated fixed effect for each worker from estimating Equation B.2 as our measure of “Discretionary Bonus,” which ranges from 0 to 100, where higher values indicate workers benefit relatively more from discretionary bonuses. After September 2023, the factory removed all rules-based individual bonuses so that all individual bonuses were solely allocated at the discretion of supervisors. Therefore, in analysis of events that occur after September 2023, we simply use individual bonus earnings as our measure of Discretionary Bonus.

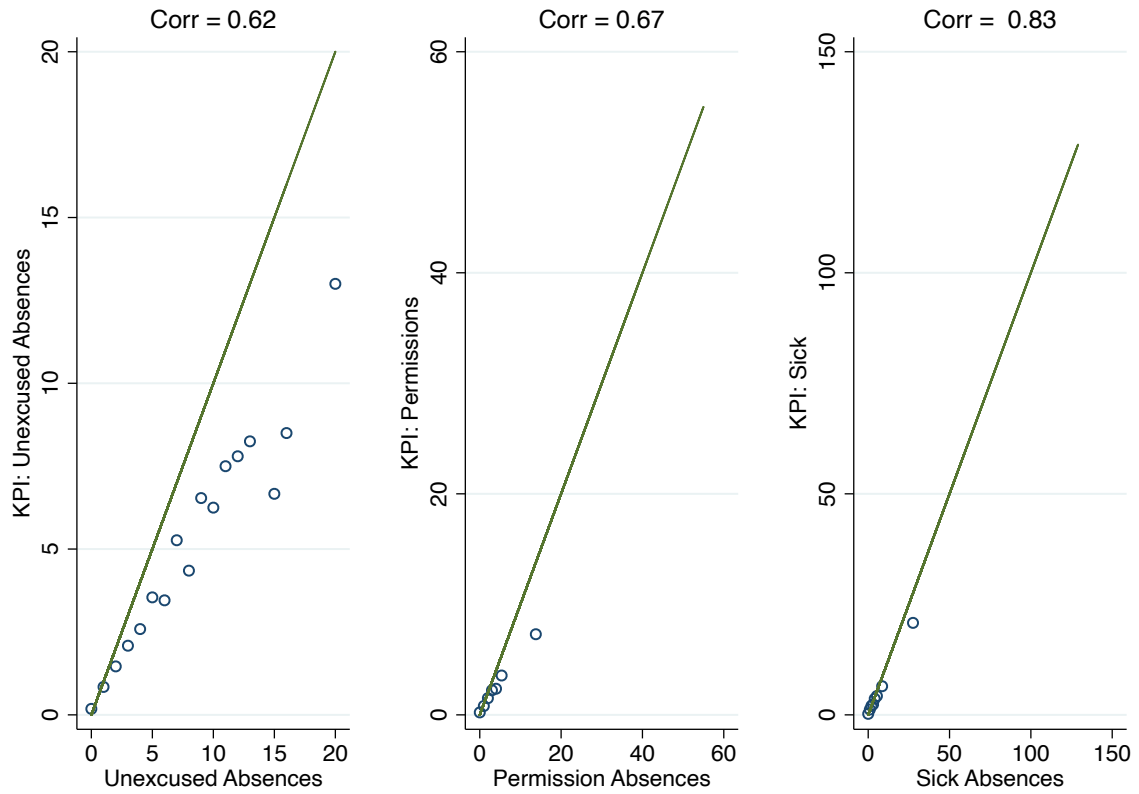


Figure B.11: Discretion in KPIs

Notes: This figure shows binned scatterplots of the correlation between a worker's raw daily attendance record and their official Key Performance Indicators (KPIs) record for three types of attendance-related issues: unexcused absences, permission leave, and sick leave. Correlation coefficients are reported. Data is drawn from the nine month period prior to the referrals and application experiments (October 2022 - June 2023). Observations below the green 45 degree line indicate that there are more issues in a worker's daily attendance data than what is recorded on their KPI record, consistent with beneficial supervisor discretion.

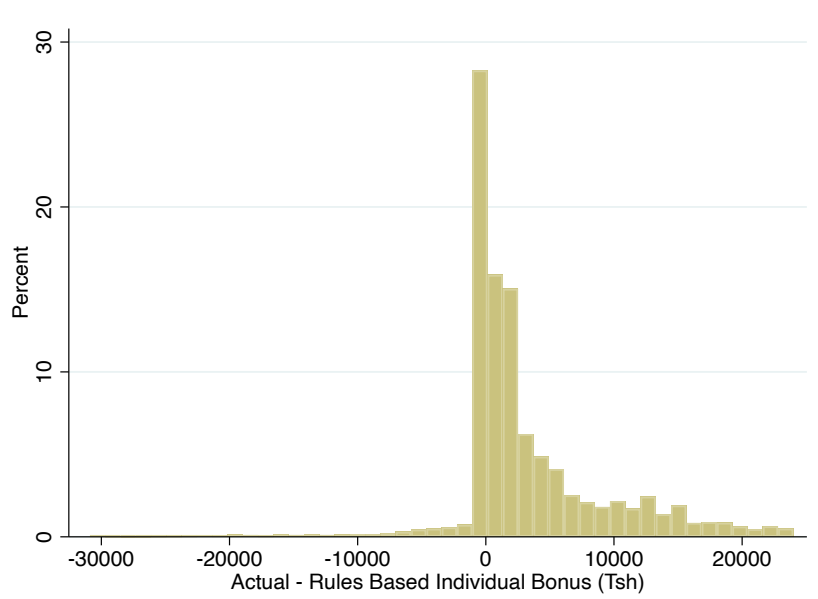


Figure B.12: Discretion in Individual Bonus Payments

Notes: This figure shows the distribution of discretionary individual bonus payments to workers, calculated as the difference between the actual amount of individual bonus a worker receives and the rules-based amount of bonus they earned based on their task-specific bonus schedule, trimmed at the 1st and 99th percentiles. Individual bonuses are paid at a weekly level in Tanzanian shillings. Data is drawn from the period when the factory collected individual output data and implemented a rules-based bonus system (June 2022 - September 2023).

Appendix C

Leadership Test Questions

Section A – Production Knowledge

There are three different versions of the production test: Cutting, Sewing, and Finishing. Workers only receive the version of the production test that matches their job description.

Cutting Production Test

A.1 Cutting Process – Arrange the following 6 cutting processes in the correct sequence step by step, starting from the beginning to the last step. Enter “1” for the first step, “2” for the second step, and continue to “6” for the last step.

Cutting	
Fabric relaxing as per the buyer requirements	
Numbering	
Bundling	
PO wise fabric receiving from main warehouse	
Fabric laying	

A.2 Causes of Quality issues in Cutting

A.2.1. Why do we put notches/cut-marks during cutting?

A.2.2. What's the danger of not following table markings during laying?

A.2.3. Why should the marker be checked before laying?

A.2.4. Why do we do numbering?

A.2.5. Why do we do bundling in cutting?

A.2.6. Why should laying be done according to shade allocation?

A.2.7. Why is it necessary to give identity off-cuts?

Sewing Production Test

Choose the correct answer from the choices provided

A.1. SPI (Stitches Per Inch) – What is the meaning SPI (Stitches per Inch)?

- ☐ A. The machine speed per inch
- ☐ B. The distance between each needle stitch per inch
- ☐ C. The amount of different needle stitch types per inch

A.1.2. Why is it important to set the SPI (Stiches Per Inch) on the machine and by whom should this be done?

- ☐ A. Before sewing starts, the machine SPI (Stitches per Inch) is determined by each machine. So, depending on the specifications of the buyer, there will be used different types of machines.
- ☐ B. B. Before the sewing starts, the machine SPI (Stitches Per Inch) needs to be set by the Mechanic as per the technical specifications by the buyer. Also, Supervisors should be aware. No one is allowed to tamper with this setup, as this may cause production variation.
- ☐ C. C. Before the sewing starts, the machine SPI (Stitches Per Inch) is set by the Manager on each machine to assure maximum speed.

A.2. Parts of a Garment

*The letters A, B, C, D, E and F identify different parts of a garment in the pictures below.
Indicate which letter correctly identifies each part of the garment listed in the table.*

Back Yoke	
Coin Pocket	
Front Panel	
Back Panel	
Waistband	
Back Pocket	

A.3. Sewing Machines

Identify the correct machine used to tailor the areas marked by the letters A, B, C, D, E, F, G, and H in the pictures below.

Single Needle Top Stitch	
5 Thread Overlock	
Kansai (Belt)	
Flat Lock (Cover Stitch)	
FOA (Felt Seam)	
5 Thread Overlock + Single Needle Chain Stitch	

A.4. Causes of Quality Issues

Choose the correct answer(s) from the choices provided

A.4.1. What causes High/Low at corner close?

A. Cutting mistake

B. Different sizes of panels

C. Sewing not done correctly

D. Not following mark at corner close belt area

☐☐

A.4.2. What are the TWO reasons for twisted leg?

A. Washing with too hot water

B. Bundle has been stored poorly

C. Wrong size panels

D. Missing cut marks / Poor operator handling

☐☐☐☐

A.4.3. What is the cause of out of shape hips?

A. Misplaced back pockets

B. Machine error

C. Not following gauge / Wrongly cut panels

D. Wrong fabric

☐☐

A.4.4. What causes out of shape waistband?

A. Sewing has not been done correctly

B. Not following marks

C. Operator has pulled fabric

D. Laundry used wrong washing formula

☐☐

A.4.5. Give TWO causes of skip stitch at chain stitch

A. Improper setting of the looper

B. Mechanic has not set machine properly

C. Power voltage not adequate for machine

D. Wrong needle size / Blunt needle

☐☐☐☐

A.4.6. Give TWO causes of needle holes

A. Wrong needle size / Blunt needle

B. Improper setting of the feed-dog

C. Operator misusing the trimmer

D. Cutting mistake

() ()

Finishing Production Test

A.1. Finishing Process – Arrange the following 10 finishing processes in the correct sequence step by step, starting from the beginning to the last step. Enter “1” for the first step, “2” for the second step, and continue to “10” for the last step.

Trimming	
Packing	
Button Attach	
Pressing	
Final QC	
Loop Cutting	
100% Waist and Inseam Measurement	
Tagging	
Heat-Seal	
Shading	

A.2. Causes of Quality Issues in Finishing

Choose the correct answer(s) from the choices provided

A.2.1. What causes shine marks in pressing?

A. Pressing without using iron shoe

B. Temperature is too hot

C. Machine error

D. Operator leaving iron too long on garment

☐

A.2.2. Name TWO causes of cut damage in finishing

A. Washing mistake

B. Trimming

C. Ironing too hot

D. Loop cutting

☐☐

A.2.3. What is the cause of oxidation in finishing?

A. Washing mistake

B. Ironing operator misuse

C. Exposing garments to light for long hours

D. Oxidation is not possible on denim garments

☐

A.2.4. What could be the cause of watermarks in finishing?

A. Wet steam during pressing and also poor housekeeping

B. Heavy rains and weather conditions

C. Laundry has not dried garments well

D. Packaging is humid

☐

A.3. Quality Issues

Identify the correct name for each defect depicted in the pictures below and labeled by the letters A, B, C, D, E, F, G, H, I, and J.

Loose Tension	
Missing Bartack	
Pilling	
Run-off	
Seam Puckering	
Pleat	
Colour Shade	
Broken Stitch	
Fabric Defect	
Raw Edge	

Section B - Soft Skills

For each of the statements below, circle the response that best characterizes the extent that you agree with the statement with 1 being “Not at all”, 2 being “To a little extent”, 3 being “To some extent”, 4 being “To a large extent”, and 5 being “To a great extent”

	Not at all	To a little extent	To some extent	To a large extent	To a great extent
B1. I need a push to get started	1	2	3	4	5
B2. I pay attention to details	1	2	3	4	5
B3. At times, I think I am no good at all	1	2	3	4	5
B4. I get sidetracked when I work	1	2	3	4	5
B5. I believe that my success depends on ability rather than luck	1	2	3	4	5
B6. It is not wise to plan too far ahead because many things turn out to be a matter of luck anyway	1	2	3	4	5
B7. I find time to listen to members of my line	1	2	3	4	5

	Not at all	To a little extent	To some extent	To a large extent	To a great extent
B8. I keep to myself	1	2	3	4	5
B9. I am able to do things as well as most other people	1	2	3	4	5
B10. I make plans and stick to them	1	2	3	4	5
B11. When I'm doing something and obstacles get in the way, I am very likely to see it through	1	2	3	4	5
B12. I believe some people are born lucky	1	2	3	4	5

Section C – Work Style

For each question below, please circle the answer choice that best describes you.

C1. If a problem arises at work, I usually:

- a. Find a solution on my own
- b. Don't do anything, the problem usually fixes itself
- c. Involve a supervisor or incharge to find a solution

☐

C2. Suppose you have two tasks, one easy and one hard. Both need to be done today, and you have enough time and resources to do both today. You have the choice between two options. Which option would you choose?

- a. Do the easy task first
- b. Do the hard task first

☐

Section D - Arithmetic

Please answer the following arithmetic problems to the best of your ability

D.A. $1.3 + 19.1 =$ _____

D.B. $22.25 - 7.08 =$ _____

D.C. Which is larger, $\frac{1}{2}$ or $\frac{1}{3}$? _____

D.D. Which of these mean $\frac{7}{10}$? *(Indicate your answer by circling the correct answer choice below)*

- a. 70
- b. 7
- c. 0.7
- d. 0.07

()

Let's say the bonus rule for a task is this: If you make 1,500 units you earn 1,000 Tsh, and for each 100 units you make above 1,500 you earn an additional 150 Tsh.

D.E. Based on this rule, how much bonus would you earn if you produced 1,250 units?

Answer: _____

D.F. Based on this rule, how much bonus would you earn if you produced 1,500 units?

Answer: _____

D.G. Based on this rule, how much bonus would you earn if you produced 1,750 units?

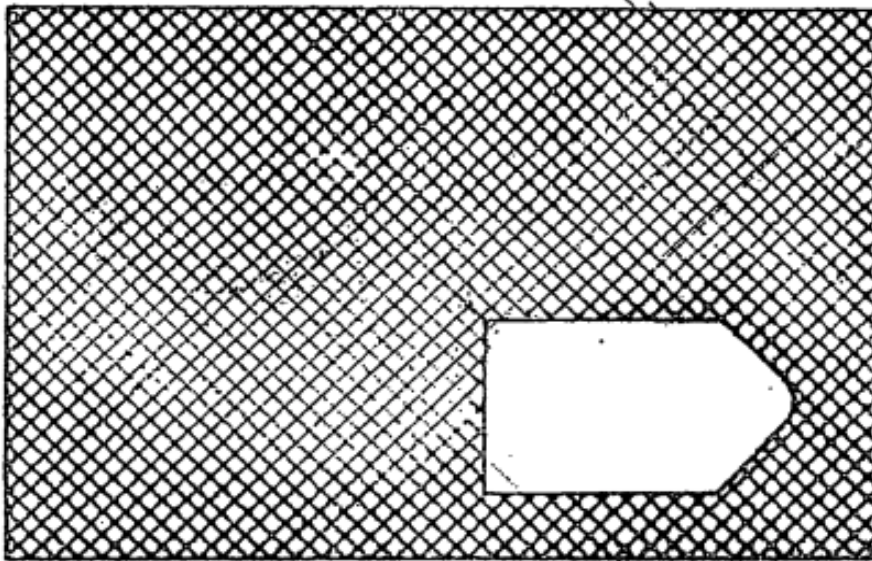
Answer: _____

Section E – Graphic Puzzles

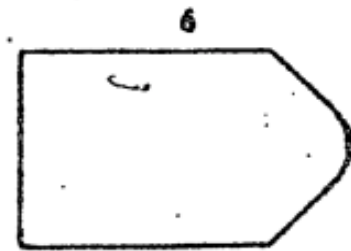
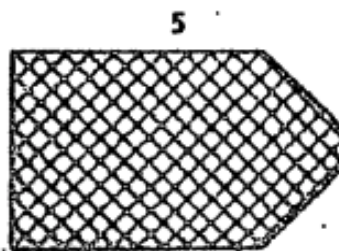
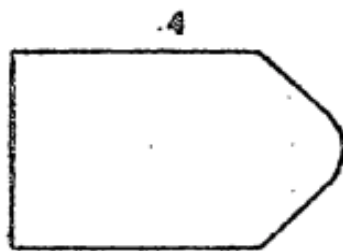
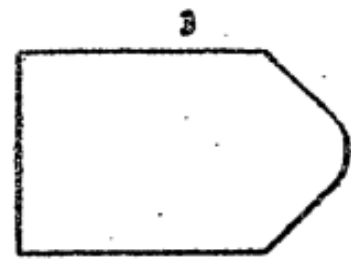
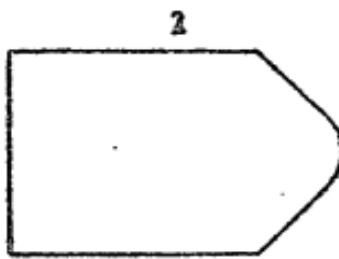
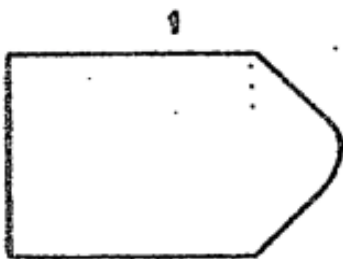
For the following questions, please indicate your answer by writing the number of the piece that completes the diagram correctly among the pieces numbered 1, 2, 3, 4, 5, and 6 in the brackets (parentheses) placed in front of the diagram.

Example

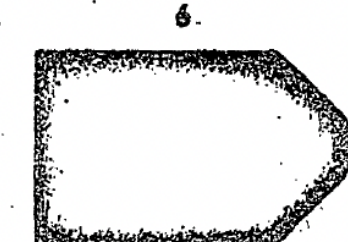
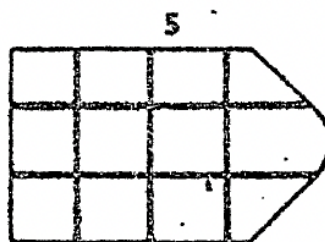
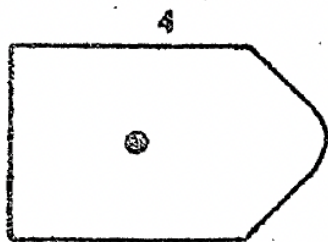
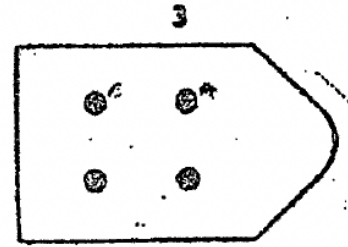
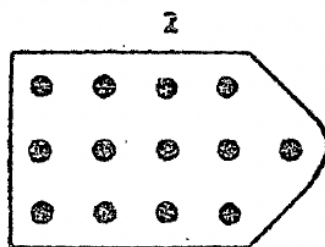
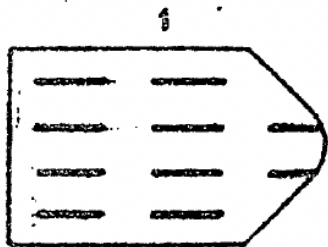
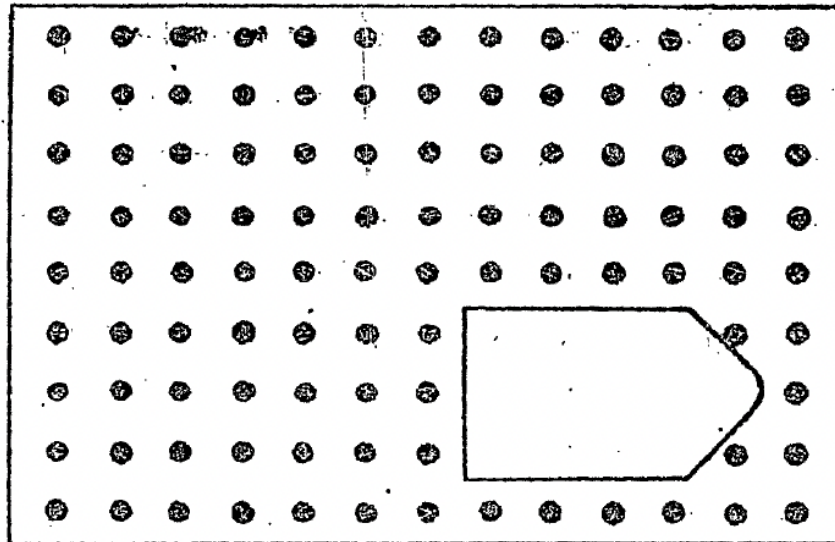
For this diagram, piece “5” best fits the overall pattern



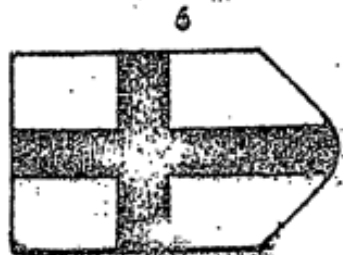
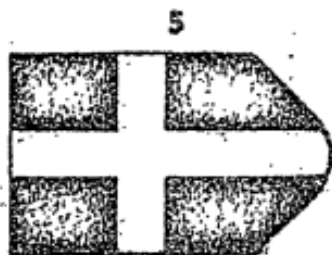
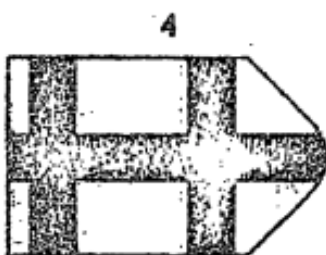
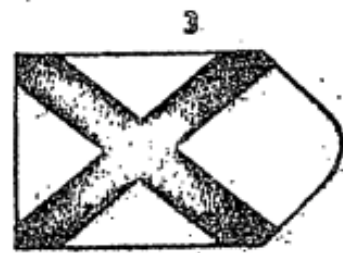
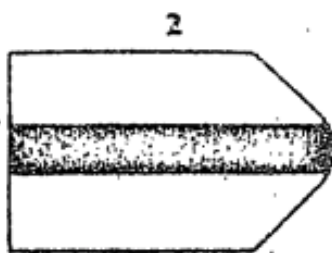
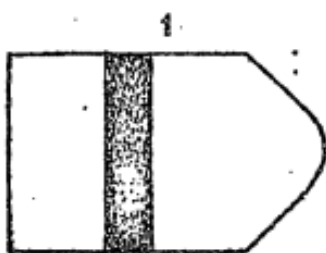
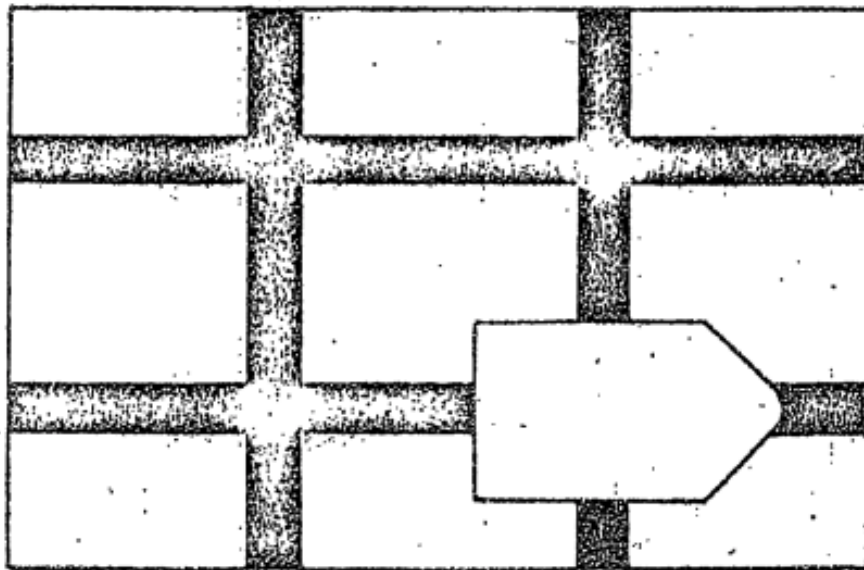
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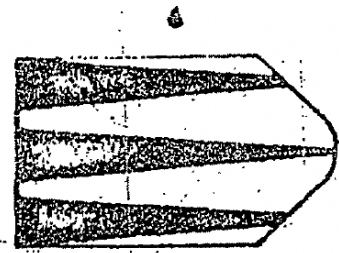
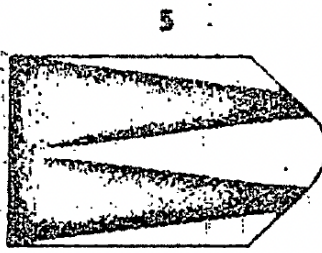
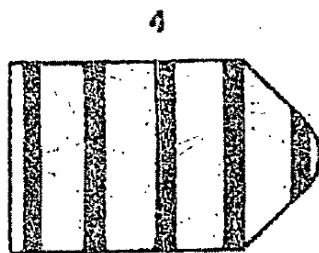
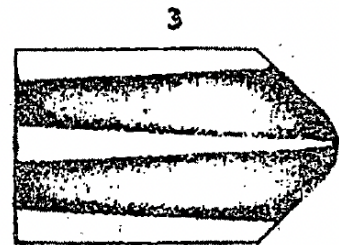
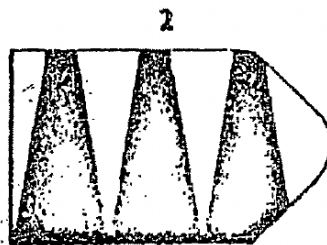
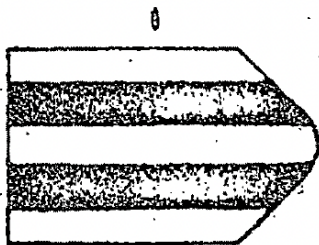
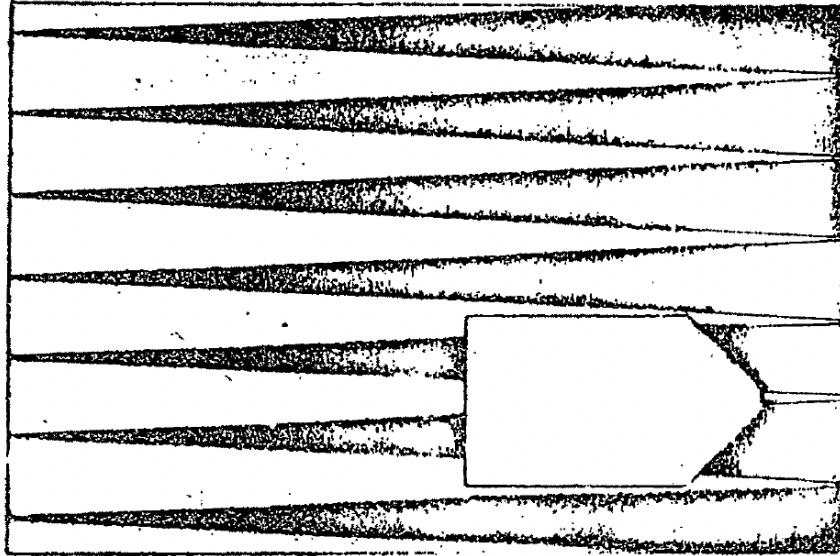
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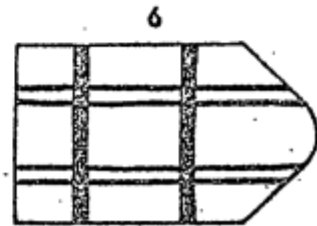
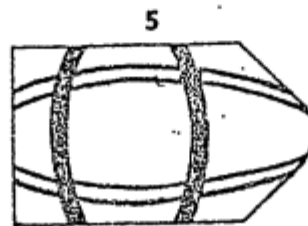
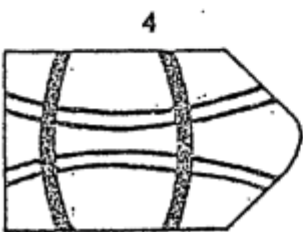
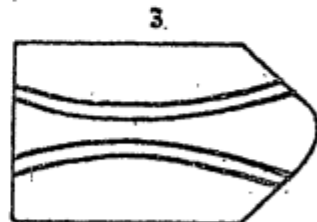
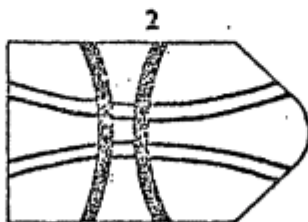
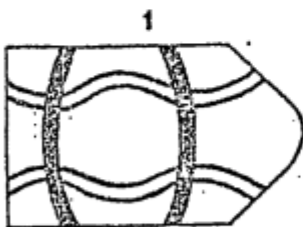
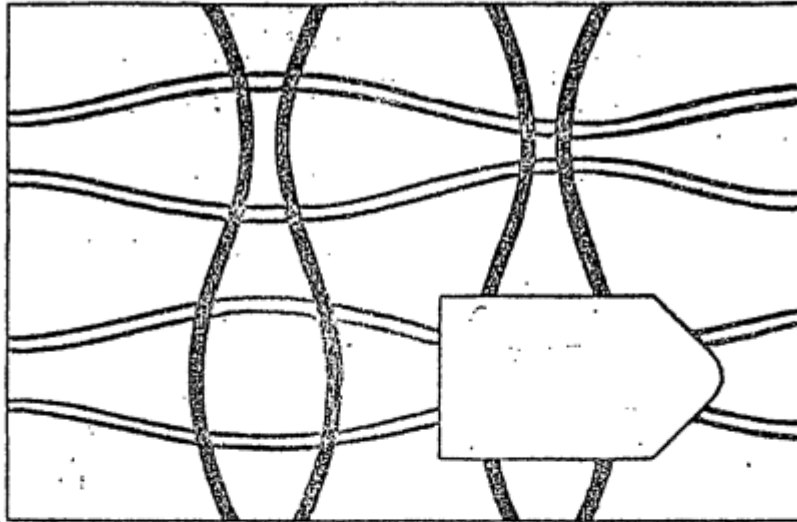
E2



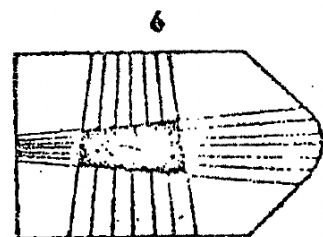
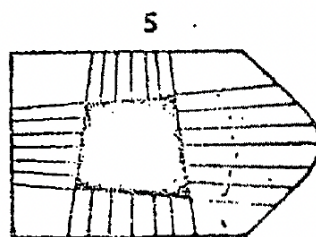
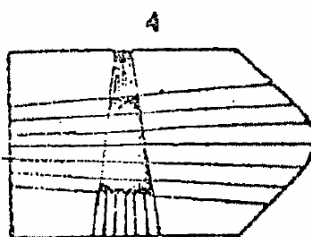
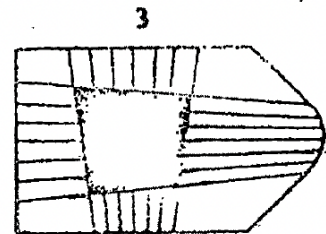
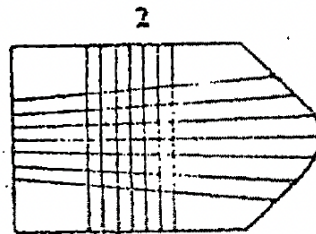
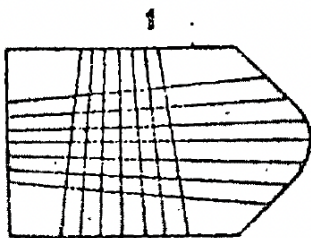
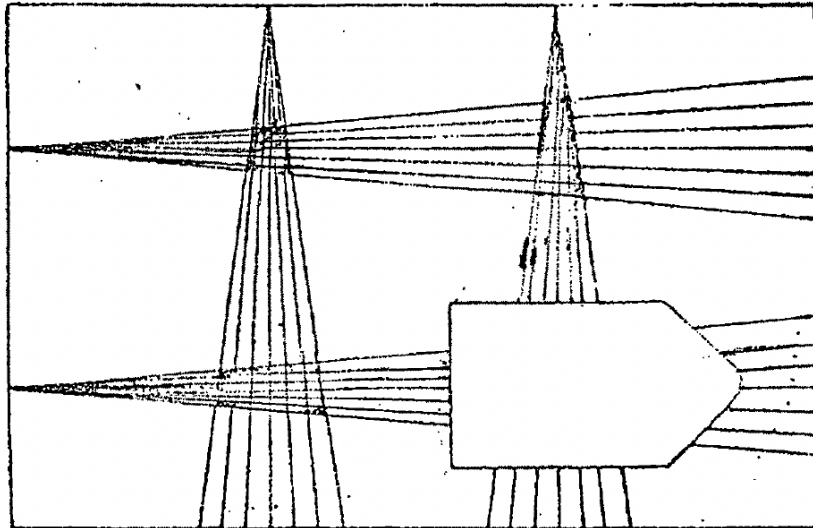
E3



E4



E5



Appendix D

Supervisor Referrals - Moderator Script

Hello, my name is _____ and I work for an independent survey firm [name]. We are partnering with [firm name] to study their professional development opportunities for workers. As you may recall, [firm name] is conducting a Skills and Leadership Training Program in July-August. The purpose of the training is to identify promising workers and train them in technical production skills, leadership, and management skills. Since space is limited, only some workers will be selected to participate in the training. The HR team will select workers for the training based on a variety of criteria, including supervisor referrals. As current supervisors, you have the opportunity to recommend workers who are below the Supervisor level for the training.

Please note that as current supervisors, you are already leaders at [firm name], so the training is not intended for you. The purpose of the training is to professionalize the skills of entry-level workers. The training will not negatively impact the employment of any current supervisors and will not result in the substitution of any current supervisors.

To give you more details, the training will take place for approximately 3 weeks in July - August, Monday - Friday from 8am - 5pm. Selected trainees are expected to attend every day of the training and to show up on time. Trainees will continue to receive their regular base salary throughout the training program. All trainees who successfully complete the training will receive a Training Certificate. At the end of the training, the HR team will assess the technical and leadership skills of each trainee through a verbal technical test and a panel interview.

We would now like to invite you to a brief session which gives you the opportunity to recommend up to 2 workers for the Leadership Training program. If you agree to participate, you will be randomly assigned to a smaller session which will occur directly after this. During the session, we will explain the referral process further and you will be given the opportunity to refer up to 2 workers for the training. If you would like to participate, please simply remain in this room and await further instructions. If you do not wish to participate, you may simply leave the meeting at this time. Please note that participation is strictly voluntary and will not negatively affect your employment or compensation. Thank you for your time and attention.

[Session moderator: Please go 1 by 1 in the order that respondents are seated and assign them to either Group A or Group B. As you assign someone to Group A, tell them to stand on one side of the room. As you assign someone to Group B, tell them to stand on the opposite side of the room. Continue this process until everyone has been assigned to Group A or Group B. Make sure supervisors do not switch their assignments during this process!]

Then assign 1 enumerator to lead Group A and a second enumerator to lead Group B. We want approximately 1 enumerator for every 10 supervisors. If there are 20 or more supervisors in each

group, assign 2 enumerators for Group A (1 enumerator for half of Group A, 1 enumerator for the second half of Group A) and 2 enumerators for Group B (1 enumerator for half of Group B, 1 enumerator for the second half of Group B). Each enumerator should take their assigned group to a quiet location outside to conduct the referral process. IMPORTANT: Please make sure that Groups A and Groups B are taken to completely separate areas where they will not overhear or be able to see what is going on in the other group.]

Supervisor Referral Script - Group A

Hello, my name is _____, I work with the survey firm [name], and I will now discuss the referral process with you during this meeting. You will now be given the opportunity to refer up to 2 workers for the Skills and Leadership Training program. You can refer any worker at [firm name], not just the workers you currently supervise, as long as the worker is not already a supervisor.

In appreciation for your referrals, for each worker you refer, if that worker successfully completes the entire training and scores within the top 50% of the training cohort, as measured by their scores on the verbal technical test and panel interview, you will receive a referral bonus of 20,000Tsh, which will be paid to you via mobile money within 2 weeks of the training program finishing (roughly by the end of August). Specifically, among the 2 workers you refer, if none complete the training or score within the top 50% of the training cohort, you will not receive any referral bonus; if 1 of the workers you refer completes the training and scores within the top 50% of the training cohort you will receive a referral bonus of 20,000 Tsh, and if both of the workers you refer complete the training and score within the top 50% of the training cohort you will receive a referral bonus of 40,000 Tsh. Do you understand how your referral bonus will be determined? If you have any questions about the referral bonuses I can answer them now.

[Enumerator hands out the Supervisor Referral Forms]

I have just handed you a Supervisor Referral Form, which I will now briefly review with you. The top of the form asks for your name and ID number. The form also asks for your phone number and a second phone number if you have one, please make sure you put an accurate phone number where we may reach you. The form also asks what facility, line or department, and job description you currently have. Next, you have the option to refer up to 2 workers for the training program in the boxes. For each worker you want to refer, please provide their name, ID number, phone, facility, line or department, and job description in one of the boxes. It is ok if you do not know all of this information for the worker you are referring, please just fill out this section to the best of your ability. You may use your phone to fill out the information.

The second page of the form asks you three additional questions. The first question asks what are the 3 most important responsibilities you have in your role as supervisor. The second question asks what are the 3 most important skills or traits you think someone should have to succeed as a supervisor at [firm name]. The third question asks what is one question you would ask in an interview to assess whether someone has the necessary skills or traits to succeed in a leadership role at [firm name]. There are no right or wrong answers, we just want to know your opinions. Please fill out this section to the best of your ability. If anything is unclear about the form, please ask now for clarifications.

Any information you provide on this form will be shared with [firm name] as well as with the research team and for research purposes may be associated with other existing data from the factory. You are free to skip any section of the form that you do not want to fill out.

We will now give you 10 minutes to read and complete the referral form. To ensure everyone has privacy to complete their forms, please do not look at anyone else's form and please do not talk to anyone else at this time. Please hold all questions until after all forms have been collected. Please try to complete the form on your own to the best of your ability. If you really are in need of assistance, you may raise your hand and I will come assist you. Thank you.

[After 10 minutes, the enumerator collects all forms]

Supervisor Referral Script - Group B

Hello, my name is _____, I work with the survey firm [name], and I will now discuss the referral process with you during this meeting. You will now be given the opportunity to refer up to 2 workers for the Skills and Leadership Training program. You can refer any worker at [firm name], not just the workers you currently supervise, as long as the worker is not already a supervisor.

[Enumerator hands out the Supervisor Referral Forms]

I have just handed you a Supervisor Referral Form, which I will now briefly review with you. The top of the form asks for your name and ID number. The form also asks for your phone number and a second phone number if you have one, please make sure you put an accurate phone number where we may reach you. The form also asks what facility, line or department, and job description you currently have. Next, you have the option to refer up to 2 workers for the training program in the boxes. For each worker you want to refer, please provide their name, ID number, phone, facility, line or department, and job description in one of the boxes. It is ok if you

do not know all of this information for the worker you are referring, please just fill out this section to the best of your ability. You may use your phone to fill out the information.

The second page of the form asks you three additional questions. The first question asks what are the 3 most important responsibilities you have in your role as supervisor. The second question asks what are the 3 most important skills or traits you think someone should have to succeed as a supervisor at [firm name]. The third question asks what is one question you would ask in an interview to assess whether someone has the necessary skills or traits to succeed in a leadership role at [firm name]. There are no right or wrong answers, we just want to know your opinions. Please fill out this section to the best of your ability. If anything is unclear about the form, please ask now for clarifications.

Any information you provide on this form will be shared with [firm name] as well as with the research team and for research purposes may be associated with other existing data from the factory. You are free to skip any section of the form that you do not want to fill out.

We will now give you 10 minutes to read and complete the referral form. To ensure everyone has privacy to complete their forms, please do not look at anyone else's form and please do not talk to anyone else at this time. Please hold all questions until after all forms have been collected. Please try to complete the form on your own to the best of your ability. If you really are in need of assistance, you may raise your hand and I will come assist you.

We have an announcement to share with you afterwards, so please do not leave early. Please stay seated and wait until everyone has completed their forms. Thank you.

[After 10 minutes, the enumerator collects all forms. IMPORTANT: Enumerator, please do not let respondents leave early. Remind them to stay because of an important announcement that will occur once all the forms have been completed and collected.]

You have now just completed the referral process. In appreciation for your referrals, for each worker you refer, if that worker successfully completes the entire training and scores within the top 50% of the training cohort, as measured by their scores on the verbal technical test and panel interview, you will receive a referral bonus of 20,000Tsh, which will be paid to you via mobile money within 2 weeks of the training program finishing (roughly by the end of August). Specifically, among the 2 workers you refer, if none complete the training or score within the top 50% of the training cohort, you will not receive any referral bonus; if 1 of the workers you refer completes the training and scores within the top 50% of the training cohort you will receive a referral bonus of 20,000 Tsh, and if both of the workers you refer complete the training and score within the top 50% of the training cohort you will receive a referral bonus of 40,000 Tsh. Do you understand how your referral bonus will be determined? If you have any questions about the referral bonuses I can answer them now.

Supervisor Referral Form

Name: _____ ID Number: _____

Factory: _____ Line/Department: _____

Current Job Description: _____

Phone Number: _____ Second Phone Number: _____

[Firm name] is conducting a Skills and Leadership Training program. As current supervisors, you are already leaders, so the training is not intended for you. However, as a current supervisor you are invited to recommend up to 2 workers for the training program. You can refer any worker at [firm name], not just the workers you currently supervise, as long as the worker is not already a supervisor. Any information you provide on this form will be shared with [firm name] as well as with the research team and for research purposes may be associated with other existing data from the factory. You are free to skip any section of this form.

Referrals for the Skills and Leadership Training Program

Referral #1	Referral #2
<i>Please provide the following information for the first worker you are referring:</i>	<i>Please provide the following information for the second worker you are referring:</i>
Full Name: _____	Full Name: _____
ID Number: _____	ID Number: _____
Phone: _____	Phone: _____
What is their current position?	What is their current position?
Facility: _____	Facility: _____
Line/Department: _____	Line/Department: _____
Job Description: _____	Job Description: _____

Leadership Traits

L1. In your opinion, what are the 3 most important responsibilities of your role as supervisor?

1. _____

2. _____

3. _____

L2. In your opinion, what are the 3 most important skills or traits someone should have to succeed as a supervisor at [firm name]?

1. _____

2. _____

3. _____

L3. In your opinion, what is one question you would ask in an interview to assess whether someone has one of the skills or traits you mentioned above in L2?

Appendix E

Discretionary Application

[Firm Name] Skills and Leadership Training Application Card

You are invited to apply for the Skills and Leadership Training program. The training will take place for approximately 3 weeks in July - August, Monday - Friday from 8am - 5pm. All participants who successfully complete the training will receive a Training Certificate from. Any information you provide on this card will be shared with [firm name] as well as with the research team and for research purposes may be associated with other existing data from the factory. You are free to skip any section of this card.

Name: _____ **ID Number:** _____

Factory: _____ **Line/Department:** _____

Current Job Description: _____

Would you like to apply for the Skills and Leadership Training Program? (Please pick one option)

Note: Workers will be selected for the training based on many criteria, including their supervisor referrals.

☐ **No**

☐ **Yes**

If you selected Yes, please tell us why you are a good candidate for the Skills and Leadership training program.

.....

.....

.....

.....

Form ID #

Control Application

[Firm Name] Skills and Leadership Training Application Card

You are invited to apply for the Skills and Leadership Training program. The training will take place for approximately 3 weeks in July - August, Monday - Friday from 8am - 5pm. All participants who successfully complete the training in full will receive a Training Certificate. Any information you provide on this card will be shared with [firm name] as well as with the research team and for research purposes may be associated with other existing data from the factory. You are free to skip any section of this card.

Name: _____ **ID Number:** _____

Factory: _____ **Line/Department:** _____

Current Job Description: _____

Would you like to apply for the Skills and Leadership Training Program? (Please pick one option)

Note: Workers will be selected for the training based on many criteria, including their past performance record.

☐ No

☐ Yes

If you selected Yes, please tell us why you are a good candidate for the Skills and Leadership training program.

.....

.....

.....

.....

Form ID #

Appendix F

Worker Opinion Survey Section A - General Workplace Environment

For each of the statements below, circle the response that best characterizes the extent that you agree with the statement

A1. Overall, I am very satisfied with my workplace.	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A2. The firm's rules are very clear to me	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A3. The firm's rules are always enforced equally for everyone	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A4. I feel a lot of the time what I do at work goes unnoticed	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A5. My supervisors tend to show a lot of favoritism towards certain workers.	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A6. The best worker is unlikely to be promoted unless they have connections with supervisors	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A7. Generally speaking, the workers who work the hardest earn the most individual bonuses	Not at all	To a little extent	To some extent	To a large extent	To a great extent
A8. I tend to prefer leaders who are very similar to me in background (religion, tribe, region)	Not at all	To a little extent	To some extent	To a large extent	To a great extent

A9. Do you believe men generally make better leaders or do you believe women generally make better leaders?

- a. Men generally make better leaders
- b. Men and women equally make good leaders
- c. Women generally make better leaders

A10. Do you think your success at [firm name] depends mostly on how hard you work or do you think it mostly depends on luck and connections?

- a. Mostly depends on how hard I work
- b. Mostly depends on luck and connections

A11. Overall, how would you rate your relationship with your supervisors?

- a. Very poorly
- b. Somewhat poorly
- c. Somewhat well
- d. Very well

A12. How well do you think your supervisors know you?

- a. Not at all well
- b. Only a little well
- c. Somewhat well
- d. Very well

A13. On a typical work day, how often do your supervisors monitor or check-in on you?

- a. Almost never
- b. Only occasionally
- c. Somewhat frequently
- d. Very frequently

A14. Compared to how they treat other workers, would you say that your supervisor tends to treat you?

- a. Relatively worse
- b. The same
- c. Relatively better

Section B: Self-Evaluation

The following questions ask you about your own performance at [firm name]. Please answer these questions as accurately as possible. For questions B1 - B6, you will earn 500 Tsh for each question that you answer correctly, with a maximum possible payment of 3,000 Tsh.

B1. In the past week, what was the MAIN task that you performed and what was the production target for that task?

Task Name: _____ Task Production Target: _____

B2. In the past week, how much total bonus pay (group + individual bonus) did you receive?

_____ Tsh

B3. In the past month (March 26 - April 25) , how many times did you arrive to work late?
Write 0 if you had no late arrivals.

_____ Times

B4. In the past month (March 26 - April 25), how many unexcused absences did you have?
Write 0 if you had no unexcused absences

_____ Days

B5. In the past month (March 26 - April 25), how many days of permission leave did you take? *Write 0 if you took no permission leave.*

_____ Days

B6. Your supervisor will be asked to refer up to 2 workers for promotion, do you think you will be one of the workers referred by your supervisor? *Circle one option*

Yes

No

Compared to all the other workers on your team, how would you rate **yourself** in terms of:
Circle the answer that best describes you

B7. Meeting Targets	Poor	Below Average	Average	Above Average	Exceptional
B8. Attendance	Poor	Below Average	Average	Above Average	Exceptional
B9. KPIs	Poor	Below Average	Average	Above Average	Exceptional
B10. Overall Performance	Poor	Below Average	Average	Above Average	Exceptional
B12. Teamwork /Cooperation	Poor	Below Average	Average	Above Average	Exceptional
B13. Loyalty	Poor	Below Average	Average	Above Average	Exceptional
B14. Leadership Skills	Poor	Below Average	Average	Above Average	Exceptional
B15. Promotion Readiness	Poor	Below Average	Average	Above Average	Exceptional

Compared to all the other workers on your team, how do you think **your supervisors** would rate you in terms of:

Circle the answer that best describes you

B16. Meeting Targets	Poor	Below Average	Average	Above Average	Exceptional
B17. Attendance	Poor	Below Average	Average	Above Average	Exceptional
B18. KPIs	Poor	Below Average	Average	Above Average	Exceptional
B19. Overall Performance	Poor	Below Average	Average	Above Average	Exceptional
B21. Teamwork/ Cooperation	Poor	Below Average	Average	Above Average	Exceptional
B22. Loyalty	Poor	Below Average	Average	Above Average	Exceptional
B23. Leadership Skills	Poor	Below Average	Average	Above Average	Exceptional
B24. Promotion Readiness	Poor	Below Average	Average	Above Average	Exceptional

Section C - Promotion Decisions

Sometimes promotion opportunities come up where existing workers can be promoted to supervisor positions. For each of the questions below, write the letter of the answer choice that best describes you in the box provided.

C1. How fair would you rate the selection process for promotions at [firm name]?

- a. Very fair
- b. Somewhat fair
- c. Somewhat unfair
- d. Very unfair

C2. How much would you say that favoritism and connections play a role in which workers are promoted at [firm name]?

- a. No role at all
- b. A small role
- c. A somewhat important role
- d. A very important role

C3. How much more likely do you think it is for women to be promoted than men?

- a. Much more likely
- b. Somewhat more likely
- c. Neither more or less likely
- d. Somewhat less likely
- e. Much less likely

C4. Which of the following do you think **should be** the MOST important factor considered when selecting workers for promotion?

- a. Supervisor referrals
- b. Performance record
- c. Written test evaluating their leadership ability

Anything else you would like to share with us about your opinions about your workplace?

Appendix G

Supervisor Survey

Work facts

- What facility do you work in?
- What is the main team you currently supervise?
- When did you first start supervising this team?
- Approximately how many workers do you directly supervise?
- When did you first become a supervisor?

Referral of workers for promotion-related opportunity

- Note: As you may know, *[firm name]* is planning to promote some line-level workers to supervisors for the new facility opening later this summer. As a current supervisor, you now have the opportunity to refer up to two workers for this promotion opportunity. You may refer any worker at *[firm name]*, not just the workers you currently supervise, as long as the worker is not already a supervisor. Please refer workers who you think have the most potential to become effective, successful supervisors in the new facility.
- Would you like to refer a worker for the promotion opportunity?
 - What is the name of the worker you would like to refer?
 - Can you verify that this is the correct worker you would like to refer?
 - What is the phone number of this worker?

Evaluation of randomly selected sample of workers from their team

- Note: We have randomly selected some workers from your team and we would like to ask you a few questions about each of these randomly selected workers. Please answer these questions to the best of your ability. Note, you can earn up to an extra 5,000 Tsh depending on the accuracy of your responses to some of these questions, so you can maximize your earnings by answering each question to the best of your ability as truthfully as possible.
- I will now ask you some questions about *[worker name]*. Is this a worker you supervise currently?
- How well do you know this worker?
- On a typical work day, how often would you say you monitor or check-in on this worker?
- How long has this worker been at the factory (in years)?
- How many different operations does this worker know how to do?
- In the past week, what was the MAIN task that this worker performed?
- In the past week, how much individual bonus did this worker earn?
- In the past week, how many days did this worker work?
- In the past month, how many days was this worker:
 - Absent
 - Sick
 - Late Arriving

- Receiving a warning letters
- Compared to all the other workers on your team, how would you rate this worker in terms of their
 - Overall performance
 - Self Discipline
 - Team-work/cooperation
 - Loyalty
 - Leadership skills
 - Readiness for Promotion
- Note: Among the /xx/ workers we just asked you about, you can earn up to an extra 5,000 Tsh if you answered the questions about that worker accurately. For that worker, you will earn 1,000 Tsh for each correct answer to the following questions about that worker, earning up to a total of 5,000 Tsh:
 - In the past week, what was the MAIN task that this worker performed
 - In the past week, how much individual bonus did this worker earn?
 - How many absences do you think they have on their KPI record?
 - How many lates do you think they have on their KPI record?
 - How many warning letters do you think they have on their KPI record?
- Which worker would you like your accuracy payments to be based on?

Soft skills

- Note: Thank you for your referrals and evaluations of workers on your team. The information you have provided will be very useful for the factory to select workers for promotion. Now we will transition to the final part of the survey. In this final section, I will ask you a few questions about your private opinions and views. Your answers to these questions will be kept private and will only be used for research purposes and will not be shared with anyone else. Only anonymized and aggregated results may be shared with the factory.
- Note: Now I will read you a few statements. For each statement, please tell me which statement best describes you.
 - In general, do you believe older people always make better leaders or do you believe that young people can also be good leaders. Please give your answer on a scale from 1 to 5 where 1 means “I believe older people always make better leaders” and 5 means “I believe young people can also be good leaders.” You can use any number between 1 and 5 to indicate where you fall on the scale.
 - Do you believe men generally make better leaders or do you believe women generally make better leaders? Please give your answer on a scale from 1 to 5 where 1 means “I believe men generally make better leaders” and 5 means “I believe women generally make better leaders”. You can use any number between 1 and 5 to indicate where you fall on the scale.

- In general, do you think that whether a worker gets ahead at *[[firm name]]* depends mostly on how hard they work or do you think it mostly depends on luck and connections? Please give your answer on a scale from 1 to 5 where 1 means “Whether a worker gets ahead at *[[firm name]]* depends mostly on how hard they work” and 5 means “Whether a worker gets ahead at *[[firm name]]* depends mostly on luck and connections”. You can use any number between 1 and 5 to indicate where you fall on the scale.
- In general, do you prefer to work with people who have a very similar background to you or do you prefer to work with people who have a very different background from you? Please give your answer on a scale from 1 to 5 where 1 means you prefer to work with people who have a very similar background to you and 5 means you prefer to work with people who have a very different background from you. You can use any number between 1 and 5 to indicate where you fall on the scale.
- In general, do you think the rules should always be followed or do you think that special allowances should always be made for special circumstances? Please give your answer on a scale from 1 to 5 where 1 means you think the rules should always be followed and 5 means you think that special allowances should always be made for special circumstances. You can use any number between 1 and 5 to indicate where you fall on the scale.
- Do you think that individual bonuses should be allocated entirely based on whether workers reach their target or do you think workers can also deserve bonuses for other reasons that only a supervisor can decide? Please give your answer on a scale from 1 to 5 where 1 means you think individual bonuses should be allocated entirely based on whether workers reach their target and 5 means you think that workers can also deserve bonuses for other reasons that only a supervisor can decide.
- How willing are you to punish someone who treats you unfairly even if there may be costs to you? Please give your answer on a scale from 1 to 5 where 1 means “Completely unwilling” and 5 means “completely willing.” You can use any number between 1 and 5 to indicate where you fall on the scale.
- When someone does you a favor, how willing are you to return it? Please give your answer on a scale from 1 to 5 where 1 means “Completely unwilling” and 5 means “completely willing.” You can use any number between 1 and 5 to indicate where you fall on the scale.