The Impact of Communicating Multiple Goals: Evidence from a Field Experiment in an Energy Corporation

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Abstract

Firms often pursue and communicate multiple goals, although theory highlights the challenges of doing so. I explore the impact of communicating multiple goals on employee performance, and propose that this effect depends on how far employees are from the productivity frontier. I design a field experiment across frontline employees in a multinational energy corporation as they are evaluated on a procedure, randomly varying (1) whether they are communicated a single goal of safety or multiple goals of safety and efficiency; (2) whether they are additionally provided with an observation of best practices to improve and move closer to the frontier. I find that communicating multiple goals Pareto-improves performance, and observe evidence consistent with the interpretation that this effect is driven by employees inside the frontier.

Keywords: multiple goals, incentives, best practices, field experiment, communication

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1. INTRODUCTION

Firms often pursue and communicate multiple goals to their employees (e.g., Gubler, Larkin, & Pierce, 2016; Obloj & Sengul, 2020). Factories seek increased output quantity from their workers while keeping quality defects low, and service-based businesses urge their customer representatives to deliver exceptional customer satisfaction while being efficient. Many companies also increasingly articulate socially-motivated goals such as safety and environmental sustainability in addition to profits (Burbano, 2016; Dimitriadis et al., 2017; Gubler, Larkin, & Pierce, 2018; Lee, Adbi, & Singh, 2020; Battilana et al., 2020).

Despite this empirical reality, much research recommends against communicating multiple goals for employees to pursue, especially when goals are weakly or negatively correlated.[1] Economic theory on multitasking proposes that incentivizing multiple dimensions when some are less measurable distorts employee effort (Kerr, 1975; Holmstrom & Milgrom, 1991; Baker, 1992).[2] Even when dimensions are equally measurable, organizational scholars theorize that multiple goals generate confusion and ambiguity for decision-makers and reduce their performance (Cyert & March, 1963; Porter, 1996; Jensen, 2002; Hu & Bettis, 2018; Levinthal & Rerup, 2020).[3] Rather than communicate multiple goals, these theories recommend that firms myopically choose a single goal for employees to pursue, spatially separate goals, or sequentially focus on one at a time (Ethiraj & Levinthal, 2009; Stevens et al., 2015).

This contrast between theory and empirical reality raises the question, does communicating multiple goals hurt employee performance in practice, and if so, when? Despite a rich theoretical literature on multiple goals, there has been less empirical evidence, at least in part due to two key challenges:[4] (1) the problem of *measurement*: it is difficult to observe and measure what goals firms pursue and communicate internally to their employees;[5] (2) the problem of *selection:* firms with multiple goals represent a biased selection, which confounds the treatment effect of communicating multiple goals. Understanding whether and when multiple goals hurt performance in practice is important to inform how firms should communicate their goals when managing settings with multidimensional objectives.

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[1] This applies to cases when multiple goals lack positive complementarities, such as a high volume of output and good quality. When goals are mutually reinforcing, then pursuing either one can increase the other.

[2] Holmstrom and Milgrom (1991) suggest that whenever tasks are separable, they can be carried out by different employees at different times. For example, if quality control can be allocated to a different worker from that in the production line that is maximizing output, the problem posed by incentives based on quantity can be mitigated or even eliminated.

[3] If all goals share the same performance measure, this problem should not arise as the net impact of an action can be reduced to a scalar value. But, this is rarely the case with multiple goals that are weakly or negatively correlated.

[4] Growing work suggests that frontline employees dynamically make tradeoffs (Gaba & Greve, 2019; Gubler, Liu, & Roman, 2021) and face ambiguity in how to do so (Levinthal & Rerup, 2020), but leaves open the broader question of whether multiple goals hurt or improve performance across dimensions.

[5] Much research infers or assumes that multiple goals exist and are communicated across the organization. A key way in which firms have employees pursue multiple goals is through communicating them (e.g., via instruction, incentives).

In this paper, I empirically evaluate the impact of communicating multiple goals on employee performance and explore the conditions under which it hurts performance. I leverage a field experiment across frontline employees in three subsidiary companies of a Fortune 200 energy corporation. The design of the experiment enables me to address both the measurement and selection problems, by explicitly communicating multiple goals or a single goal to employees and randomly assigning this across the organization.

I propose that the impact of multiple goals depends on where employees are relative to the productivity frontier. When employees are on the productivity frontier, they face tradeoffs between goals: moving along the frontier means that any gain in one goal must come at the cost of another, and may thereby hurt performance. However, when employees are inside the frontier, they can move closer to the frontier, improving performance along multiple goals. While much of the theoretical literature has assumed that employees and firms are on the productivity frontier, recent empirical evidence suggests that there is a large dispersion in productivity both across and within firms (Bloom and Van Reenen 2007, Bloom et al 2013, Bruhn et al 2018, Bloom et al 2020). A long tail of firms being inside the productivity frontier could reconcile the prevalence of multiple goals in practice with the contrasting theoretical recommendations. Consistent with this, I find evidence that suggests that where employees are on the productivity frontier may shape whether multiple goals hurt performance.

The experiment was implemented across all pairs of linemen in the three subsidiary companies as they were being retrained and evaluated on a key activity called grounding. Consisting of connecting electrical lines to the earth to de-energize them, this procedure was time-consuming and needed to be conducted before and after any work on live lines—thus having critical implications for both safety and efficiency. As in many other settings (Bennett, 2014; Greve & Sedel, 2014; Gaba & Greve, 2019), safety and efficiency were viewed as being directly in conflict, as the key steps to increase safety would increase the amount of time taken for the procedure at the productivity frontier.

To evaluate the impact of multiple goals on performance, the key experimental arm randomized what linemen were instructed to focus their efforts on: safety alone ("*Control*") or both safety and efficiency ("*Multiple Goals*"). At the time of the experiment, the company provided a unique opportunity to credibly vary the number of goals communicated. There was broad consensus that improving safety was a key goal, but internal debate on whether to communicate safety alone, or safety along with efficiency—which resulted in variation of communication across managers, across whom linemen were rotated on a regular basis. This variation meant that employees followed what each manager communicated, enabling either a single goal of safety or multiple goals of efficiency and safety to be randomly assigned and yet credibly communicated. I evaluate the effect of this communication and how it varies depending on where employees are relative to the productivity frontier, by measuring the baseline performance of all linemen pairs prior to treatment and exploring heterogeneity in treatment effects based on this baseline performance.

To further unpack the role of the productivity frontier, I also implemented a second treatment arm to encourage the transfer of best practices ("*Best Practice*"),[6] a central way in which firms try to move employees closer to the productivity frontier (Szulanski 1996, Bloom et al 2020). This treatment provided the direct observation of linemen in another subsidiary performing best practices in grounding, following a common way in which companies often implement best practice transfer to enable learning (Inkpen 2005, 2008, Argote and Fahrenkopf 2016).[7] This second treatment arm was cross-randomized with the first, to explore the impact of best practice observation alone and together with multiple goals communication.

This design resulted in four experimental conditions, where the three treatment conditions layered treatments on top of the "*Control*" condition that provided baseline communication on safety: (1) "*Multiple Goals"* added communication on pursuing efficiency in addition to safety; (2) "*Best Practice"* added video footage of linemen from another subsidiary implementing best practices in grounding; (3) *Best Practice + Multiple goals* added both the additional communication on pursuing efficiency *and* the best practice video footage.[8] All treatments were implemented digitally as videos, with all 270 linemen pairs randomly assigned to view one of the four types of videos. After watching their assigned video, all linemen performed the grounding procedure again and were confidentially evaluated on both their efficiency (time taken to complete) and safety (a score based on an internal company rubric).

I find that linemen assigned to *Multiple Goals* showed higher efficiency without decreasing their safety, even though safety and efficiency in this setting are unlikely to have a natural positive complementarity. Compared to the *Control* group assigned to pursue safety alone, linemen assigned to *Multiple Goals* reduced their time by 11% on average, with no economically or statistically significant decrease in safety scores. In fact, many linemen pairs displayed improvements in both safety and efficiency compared to their baseline performance.

Consistent with the interpretation that this positive impact may have been driven by employees inside the productivity frontier, linemen pairs displayed a large variation in efficiency and safety at baseline, and pairs who were both slow and less safe were more likely to improve in both dimensions. Moreover, pairs provided with a *Best Practice* video also showed substantial improvements in both dimensions compared to the *Control* group, consistent with the interpretation that employees may have been inside the productivity frontier and were moved closer to the frontier through best practice observation.

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[6] Szulanski (1996) defines this as "the firm's replication of an internal practice that is performed in a superior way in some part of the organization and is deemed superior to internal alternate practices and known alternatives outside the company. […] The word 'transfer' is used rather than 'diffusion' to emphasize that the movement of knowledge within the organization is a distinct experience, not a gradual process of dissemination, and…seen as dyadic exchanges of organizational knowledge between a source and a recipient unit…[that] consists of an exact or partial replication." (p.28)

[7] This has also been shown to trigger higher motivation via peer effects in addition to information or knowledge transfer (Mas and Moretti 2009)

[8] This experimental design was pre-determined and registered on the AEA RCT Registry.

However, multiple goals had the reverse effect when paired with best practice observation. Although pairs assigned to *Best Practice + Multiple Goals* were provided with the same *Best Practice* observation and *Multiple Goals* communication that on their own improved employee performance, these improvements dissipated when the treatments were combined, such that pairs performed worse than those who received either of the treatments alone. These patterns raise the possibility that the communication of multiple goals may potentially impact the learning process beyond simply communicating the desired objectives. Evidence gathered in the field, though speculative, suggests that one possible explanation may be that multiple goals complicated the learning process, cognitively hindering how linemen processed best practice information. This raises the possibility that although many firms in practice use best practice observation to facilitate improvement upon multiple goals, it may not have the intended effects.

These findings contribute to the growing literature on the challenges of managing multiple goals (Ethiraj & Levinthal, 2009; Hu & Bettis 2018; Gaba & Greve, 2019; Obloj & Sengul, 2020). The results indicate that contrary to conventional wisdom, pursuing multiple goals can lead to performance gains relative to focusing on a single goal. The findings further propose that in determining whether to communicate multiple goals for employees to pursue, a key consideration for organizations may be how far employees are inside the productivity frontier.

This paper also contributes to the literature on best practice transfer, pointing to a potential limitation of best practice observation when paired with communication on multiple goals. Prior research has provided evidence that information on best practices can improve their adoption and subsequent firm performance (e.g. Bloom & Van Reenen, 2007; Bloom et al., 2013; Chatterji et al., 2019), while also pointing to the challenges of knowledge transfer arising from the attributes of the process (e.g., the individuals involved, the tasks or routines embedded in the organization, and the tools used for transfer) (Argote & Miron-Spektor, 2011; Argote & Fahrenkopf, 2016). The findings from this paper show evidence consistent with the potential benefits of best practice observation, but also suggest that managerial communication of goals may be a key factor that impacts best practice transfer within organizations. This suggests that while firms increasingly have various data sources that they could learn from, both across the internal organization (Brynjolfsson & McElheran, 2019) and the broader market (Kim, 2021), firms may potentially need to approach this carefully, as providing more observation-based information to employees may in some cases worsen learning when pursuing multiple goals.

2. CONCEPTUAL MOTIVATION AND RELATED LITERATURE

While much theoretical research highlights the negative impact of multiple goals on employee performance, there has been limited causal empirical evidence. I evaluate the impact of multiple goals through a field experiment that allows the random assignment of multiple goals

communication within an energy corporation, and propose that the impact of multiple goals may depend on where employees are relative to the productivity frontier: while multiple goals may have negative performance effects as theorized when employees are on the frontier, they can have positive impacts when employees are inside the frontier.

2.1 The impact of multiple goals

Theory across economics and strategy posits that having employees pursue multiple negatively or weakly correlated goals may hurt their performance. Agency theory highlights that multiple goals can distort employee effort across goals due to incentive misalignment and asymmetric measurement across goals (Kerr, 1975; Holmstrom & Milgrom, 1991; Baker, 1992). The canonical Holmstrom and Milgrom (1991) model theorizes that incentivizing employees to pursue more than one goal results in employees trading off effort for goals that are more measurable. Research building on this work suggests that better contract design (e.g. spatially separating goals or aggregating tasks depending on their relative measurability) or improved measurement can help mitigate these problems. Yet even in these cases, organizational theory proposes that unless objectives are perfectly correlated, communicating multiple goals to employees will hurt performance by generating confusion and complexity (Simon, 1955; Jensen 2002, Ethiraj and Levinthal, 2009). This literature theorizes that performance will decrease with the number of simultaneous goals pursued by an organization (e.g. Battilana & Dorado, 2010; Hahn et al., 2015; Battilana et al., 2020; Obloj & Sengul, 2020), and recommends that firms myopically choose a single goal and ignore the others, or focus sequentially on one at a time (Ethiraj & Levinthal, 2009; Joseph & Wilson, 2018).

Despite this rich theoretical literature, causal evidence on the negative performance implications of multiple goals has been limited, due to the challenges of measurement and selection bias. The challenge of measurement stems from the difficulty of observing evidence from within organizations on goal pursuit and communication. Given this, empirical studies have often had to assume the presence of multiple objectives (e.g., Hu and Bettis 2018; Gaba and Greve 2019) or infer them (McCann and Vroom 2014).

Teasing apart the treatment effect of multiple goals from the embedded selection bias has been more elusive. Prior work has documented negative correlations between measures of firm performance and multiple goals (Meyer & Gupta, 1994; Stevens et al., 2015; Hu & Bettis, 2018; Obloj & Sengul, 2020). Notably, Obloj and Sengul (2020) analyze a survey panel of French manufacturing firms over 1999-2004 and document a negative correlation between the reported number of objectives indicated in the survey (e.g. increasing revenues, decreasing costs) and corresponding measures of performance. However, as they note, a key problem of interpreting this negative correlation as causal is that firms that select into communicating and pursuing multiple goals are different from those that do not: for example, firms may be more likely to pursue multiple goals when they are underperforming,

or when they are pursuing tasks with more dimensions that are naturally more difficult than single-goal tasks. Depending on the size of this bias, the directionality of the effect of multiple goals may reverse in sign.

Related work mostly in economics has provided some insight by using plausibly exogenous variation within organizations. Rather than exploring the impact of communicating or pursuing multiple objectives on overall performance, this work has generally focused on testing the predictions of the standard multitasking model that incentivizing easily measurable objectives will lead employees to neglect unrewarded ones. Surprisingly, it has yielded limited evidence of effort distortion as theorized.[9] Hong et al (2018) provide experimental evidence that only a subsample of workers in a factory trade off quality for quantity, and Al-Ubaydli et al (2015), Hossain and Li (2014), Englmaier et al (2017), and Kim and Slonim (2021) all find that workers across different settings increase the quality of their work without sacrificing quantity. Chetty et al (2014) find little evidence of tradeoffs between review quality and quicker turnarounds among referees at the Journal of Public Economics. Educational experiments by Glewwe et al (2010) and Muralidharan and Sundararaman (2013) show that performance pay to teachers increases student performance in the incentivized dimensions without adverse effects on unrewarded dimensions. Similarly, Gubler, Liu, and Roman (2021) provide evidence suggesting that emergency crews dynamically adjust their behavior to prioritize both financial and social objectives of their agency. This research raises the possibility that multiple objectives may not hurt performance, and highlights the importance of causal empirical evidence on this question.

This paper builds on this research to directly test whether and when the communication of multiple goals to employees hurts their performance. It provides evidence using a randomized controlled trial within three companies inside a large corporation, where random assignment allows me to tease apart the treatment effect of communicating multiple goals.

2.2 Multiple goals and the productivity frontier

I explore whether the impact of multiple goals may vary depending on where employees are relative to the productivity frontier. While much of the theoretical literature has assumed that employees and firms are on the productivity frontier, growing empirical evidence suggests that a large dispersion in productivity remains both across and within organizations after controlling for "hard" inputs like technology and capital intensity. Even across homogenous goods industries such as ready-mixed concrete, boxes, gasoline, ice, and sugar, Syverson (2004) and Foster, Haltiwanger, and

[9] It is worth noting that there has been a large related literature providing evidence of extrinsic incentives crowding out intrinsic motivation (e.g., Deci et al 1999, Frey 1997, Gneezy and Rustichini 1997). This is related but different, as these generally do not examine settings with multiple objectives – rather, much of this work evaluates the impact of providing external motivation for the same goal on performance effects suggesting that internal motivation for that same goal may be reduced.

Syverson (2008) show large differences in total factor productivity, with concrete plants at the 90th percentile producing four times as much as plants in the 10th percentile. A growing body of work on management practices has also provided systematic empirical evidence across firms, industries, and countries that many firms – and units within them – may not be on the productivity frontier, showing a long tail of badly managed establishments (Bloom and Van Reenen 2007, Bloom et al 2013, Bruhn et al 2018). This dispersion in productivity could potentially reconcile the theoretical recommendations with the observed prevalence of multiple goals in practice.

Where employees are on the productivity frontier has implications for the tradeoffs they face. When employees are on the productivity frontier, they must sacrifice gains in one goal to improve in another. For example, in the context of this experiment, a skilled linemen pair on the productivity frontier faces tradeoffs: if they are already performing a thorough assessment of safety risks as quickly as possible, they may not be able to reduce their time without sacrificing safety. However, while on the frontier any gain in safety must come at the cost of efficiency, inside the frontier, a more efficient action may also improve safety (Figure 1). For a less skilled pair inside the frontier, thoroughly assessing safety risks prior to the task may help them better prepare and think through the steps, enabling them to go through the procedure and use equipment more quickly. A parallel example to illustrate this more concretely is a salesperson whose productivity is measured by time spent on calls to customers, and has 8 working hours to devote to the multiple objectives of (1) tending to existing customers and (2) pursuing new customers. A salesperson on the frontier who is already working all 8 hours cannot devote more time to pursuing new customers without reducing the time spent on tending to existing customers. But, a salesperson inside the frontier who is only working 7 of the possible 8 hours can both increase time spent on new and existing customers.

This predicts that the effect of multiple goals should depend on how far employees are from the productivity frontier. While it is difficult to measure where the productivity frontier is, one way to proxy this following the existing empirical literature (e.g., Bloom and Van Reenen 2007) is by measuring the dispersion in performance and inferring that those at the lower end of the distribution are likely to be inside the productivity frontier. I thus measure linemen pairs' baseline performance in efficiency and safety and explore the randomly assigned impact of multiple goals across this baseline. If employees display variation in their baseline performance, what we would expect to see is that employees who are relatively lower performing (e.g., both less safe and less efficient) at baseline should be more likely to improve across both dimensions. It is possible of course that even the safer and more efficient linemen pairs are inside the productivity frontier – which would then also have implications for estimating average effects: if most or all employees were inside the productivity frontier, then the average effects of multiple goals may be positive rather than negative. Conversely, if all employees were on the productivity frontier, then multiple goals should lead employees to tradeoff between safety and efficiency.

Moreover, this argument would predict that if employees were inside the frontier, they could potentially be moved closer to the productivity frontier. A key way through which firms seek to do this is the transfer of best practices. While knowledge transfer can happen in many ways such as workshops and meetings (Nonaka, 1994; Knott, 2003), personnel circulation (Kane, Argote, & Levine, 2005; Almeida & Kogut, 1999), and documented information (Haas & Hansen, 2007), one of the most common approaches is by providing a template of best practices that other employees can observe and learn from (Jensen & Szulanski, 2008; Szulanski & Jensen, 2008; Lawrence, 2020, Inkpen 2005, 2008; Bloom et al 2013).

This motivates the best practice observation treatment, which can help provide additional insight into whether employees may be inside the productivity frontier and whether best practice observation can help them move closer to the frontier. If employees were inside the productivity frontier, we would expect the provision of the best practice observation treatment alone (i.e., "*Best Practice*") to help employees move closer to the frontier – improving both their safety and efficiency. If employees were already at the frontier, best practice observation may not have any effect, or could potentially move them along the frontier, improving in one dimension while trading off performance in another.

However, the combined effect of best practice observation and multiple goals ("*Best Practice + Multiple Goals*") may not be so straightforward. On the one hand, firms often use best practice transfer and multiple goals together in practice, and if employees were inside the frontier, this would mean that best practice observation can help them move closer to the frontier and improve on both goals – meaning that multiple goals may be able to enhance this effect. However, there is also reason to believe that how employees learn from best practice observation may interact with the effect of multiple goals. Hu and Bettis (2018) show that interdependent feedback on multiple goals for a technology can distort the performance feedback an organization receives on each goal due to the technical interdependency between goals, which may apply beyond technologies to employee decisions. Ethiraj and Levinthal (2009) also theorize that multiple goals may lead to confusion or "performance freezes" due to the complexity of interpreting feedback. Furthermore, given the difficulty of inferring cause-and-effect relationships from observing others (Lippman & Rumelt, 1982; Zander & Kogut ,1995; Ryall 2009), best practice observation may generate further ambiguity and confusion. The experiment is designed to test these effects through the 2x2 design, which allows for the evaluation of the multiple goals communication and the best practice observation on their own, as well as together in combination.

3. SETTING

The experiment was run in collaboration with a multinational energy corporation, which provided a natural context to explore the impact of communicating multiple goals. Many energy companies increasingly communicate goals other than profits, such as safety or sustainability. Furthermore, these organizational goals often map directly to operational goals that employees carry out at the frontlines

of the company, meaning that customer perceptions are often formed in part by how employees carry out these goals in practice.

In this company, safety and efficiency were seen as key operational goals that employees could pursue. As in many other settings (Bennett, 2014; Greve & Seidel, 2014; Gaba & Greve, 2019),[10] safety and efficiency were viewed as being directly in conflict with each other: pursuing safety was seen as taking more time, and thus perceived to come at the cost of efficiency. A manager described: "Although safety is of high importance, sometimes it takes too much time. It might take 45 minutes to comply with the full safety protocol, even though the task might take 5 minutes….this makes it very hard to be efficient."

The company saw safety as a key goal that it sought to continuously improve on, rather than a constraint to be met. It tracked a range of safety measures beyond the number of accidents and fatalities—such as performance based on specified standards for every procedure and the number of safety violations—and was proud that their safety performance improved over time. Safety was thus seen and expressed as a goal, intended to direct where employees decided to be on the safety-efficiency spectrum. While it may seem intuitive that employees would always prioritize safety given that their own lives were at risk, many appeared to be desensitized to the potential risks of their daily work and often did not take safety precautions when not prompted, especially as accidents were a low-likelihood event. The company thus took great effort to ensure that employees followed even the most basic safety procedures.

At the time of the experiment, there was a broad consensus across the company that safety was a key goal, but internal debate and variation on whether safety alone should be communicated to employees to prioritize, or safety along with efficiency. Some managers stated that safety should never be compromised and "never be under negotiation, regardless of any efficiency goals." Others stated that while safety was a key goal, it could not come at the expense of efficiency, and advocated for mentioning efficiency as an additional priority.

This internal ambiguity provided an opportunity to experimentally and credibly vary the communication of goals to employees. Because managers varied in which goals they communicated, and linemen were rotated across managers on a regular basis, employees followed what each manager supervising them at any given time communicated. As one employee voiced, "Every supervisor says different things, so I never know how much I should prioritize safety or efficiency. It really depends on who is supervising me that day." This provided an opportunity where managers could communicate

[10] There are many examples across industries suggesting a conflict between safety and efficiency, where managers have sometimes resolved this conflict in favor of profitability. For example, General Motors sold cars with faulty ignition switches for over ten years knowing the grave safety risks they posed, as fixing or replacing them would be costly (Bennett 2014). Airlines investment in safety initiatives such as fleet maintenance and replacement require a significant investment of resources (Gaba and Greve 2019).

goals that focused solely on safety alone, or both safety and efficiency, without one version being more credible to employees.

4. EXPERIMENTAL DESIGN

The experiment was run across all linemen in three company subsidiaries as they performed a core procedure part of every task on live electrical lines. Linemen worked in pairs, which meant that 270 pairs in total were part of the experiment. Linemen pairs were monitored and assessed on two outcomes: (1) their efficiency, measured by the time they took to complete the procedure, and (2) their safety, coded using a score based on an internal company rubric. Each pair was randomly assigned to one of four experimental conditions that cross-randomized two treatment arms (see Figure 1 for a diagram of the design). One treatment arm varied whether the pair was communicated a single goal of safety, or multiple goals of safety and efficiency. The other treatment arm varied whether the pair was shown a video showcasing best practices for the procedure.

[INSERT FIGURE 2 HERE]

4.1 Experimental context, sample, and data collection

At the time of the experiment, all linemen pairs were being retrained and evaluated on an operationally important procedure called grounding, a time-consuming and safety-relevant task that enabled a natural study of multiple goals. Grounding consists of connecting electrical lines to the earth to stop any electricity flow. Because it needs to be performed at the beginning and end of any task on live electrical lines, it is a crucial task for all linemen, and has large implications for both efficiency and safety. Potential safety violations can be fatal, and yet if grounding takes two hours, the total time spent on grounding would span four hours, meaning that a linemen pair could only finish a single task in a day's shift.

While safety and efficiency are both important, they are unlikely to have positive complementarities at the productivity frontier. For example, key steps to increase safety involve carefully analyzing all potential risks and testing all equipment prior to beginning the procedure. Doing these steps thoroughly increases the time taken for the procedure, directly reducing efficiency. Conversely, linemen can speed through steps like checking for no voltage or brushing parts to remove rust and contaminants to ensure a good connection, but this gain in speed would risk safety.

Between September 2018 and April 2019, every linemen pair was scheduled for two rounds of grounding evaluations slated three months apart. The first of the evaluations was used to measure baseline performance, and the second as an opportunity to run the experiment. These were communicated as regular training evaluations, which happened multiple times throughout the year for various key procedures.

Each pair came into the training center at each of the subsidiaries at prearranged times, where they were evaluated by a training supervisor. To obtain verifiable measurability of outcomes to rule

out any inefficient contracting challenges, linemen were additionally documented by two sets of cameras, one on the ground providing the same view that the supervisor could see, and another on the linemen's body that provided a detailed view of footwork and the work being performed on the lines.

Supervisors evaluated linemen pairs on two main outcomes. They measured efficiency by recording the time they took to complete each step of the grounding procedure, as well as the full time taken. They measured safety using an internal company rubric that enabled them to assign scores from zero (worst) to five (best) for each step, which precisely outlined how to assign each score based on specific observable behavior and what may be missing. This score totaled to a maximum of twenty-five for the entire procedure. Supervisors directly entered these measures into an online database, and a head supervisor checked over all evaluations and cross-validated them each week, using the recorded linemen footage as reference if necessary. The safety rubric was standard knowledge within the company, and all linemen were fully aware of the details of the rubric and its importance.

These evaluations provided a context with high career stakes, because evaluation outcomes generally affected promotions and status changes. Poor performance resulted in sanctioning of work, as linemen who did not meet set thresholds had to undergo further evaluation before being able to continue working in the field.

Linemen were not aware of an experiment and were not informed ex-ante that these evaluations were different from standard procedures. However, since randomly assigned interventions were designed to affect linemen performance, individual pair results from the second round of evaluations were not disclosed to any direct linemen managers and not used for work sanctioning or promotions.

4.2 Experimental interventions

When linemen arrived at the training center for their second round of evaluations, they were directed to a computer at the training center set up with a feedback video of approximately 1 to 6 minutes to watch prior to performing the grounding evaluation.[11] All videos included the baseline *Control* video, which showed the training supervisors providing safety feedback on the part of the procedure that the pair had performed worst on in their baseline evaluation (first round). The grounding procedure was taught and evaluated at the company as a sequence of five steps, where each step was assessed separately in terms of time taken and safety. To ensure that videos were not too long and that differences in video lengths between treatment conditions were small, the company chose to focus on the worst-performed step for each linemen pair.

The type of video provided varied depending on the pair's assigned experimental condition. Each linemen pair was randomly assigned to one of four experimental conditions (see Figure 2), stratified

[11] The shortest video was 41 seconds, and the longest 6 minutes and 8 seconds. The *Control* videos ranged from 41s to 1m 58s. (average length 1m 5s); *Multiple Goals* videos ranged from 1m 1s to 2m 19s (average length 1m 26s); *Best Practice* videos ranged from 2m 34s to 5m 48s (average length 3m 45s); and *Best Practice + Multiple Goals* videos ranged from 2m 58s to 6m 8s (average length 4m 5s).

on their subsidiary.[12] In this setting, the channel for spillover effects across pairs to contaminate results was limited: linemen pairs were dispatched to different worksites across the country for their daily assigned tasks and traveled directly there; each pair alone came in at their assigned time to the training center; and outcomes were measured immediately after treatment – meaning that even if linemen pairs saw each other after the treatment, the outcomes had already been measured and could not be contaminated.

The *Control* video was the base video, on top of which treatments were layered. This video showed a supervisor who emphasized the importance of safety and provided feedback on how to improve it, beginning as follows:

> "Hello, my name is [Supervisor's Name], and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involved multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step [Number], [Name of Step], and the importance of safety."

The supervisor then elaborated on what prioritizing safety meant for this step, which varied depending on how linemen performed on that step at baseline. For example:

> "When a change in the work plan introducing significant risks occurs, the task should be stopped to review the hazards according to the Risk Control Hierarchy and indicate any controls and changes in the job safety analysis before continuing with the work in progress."

All videos ended with: "Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations" (Online Appendix A shows scripts of videos).

Each treatment arm layered an additional 1 to 6 minutes of video material onto the control video. The first treatment arm, *Multiple Goals*, extended the control video with the supervisor additionally emphasizing the importance of prioritizing efficiency. The supervisor began with, "I would also like to talk about the importance of efficiency," and elaborated that while safety is important, they must also execute the step "in the shortest possible time." There were 5 versions of this treatment, one for each feedback step, to emphasize this goal of efficiency within the context of the step that linemen received feedback on. For example, one of the messages stated:

[12] Random assignment was done by the researcher using a computer.

> "I would also like to talk about the important of efficiency. Grounding removal remains an important and critical part of efficient task execution, and delays due to improper handling of equipment and lack of task planning before ascending the pole should be avoided."

The second treatment arm, *Best Practice*, enabled the observation of best practices that linemen could potentially learn from. It layered onto the *Control* or *Multiple Goals* videos an additional video showing a linemen pair from another subsidiary performing best practices on the grounding step, following a common way in which best practices are transferred within companies (Argote & Fahrenkopf, 2016; Inkpen, 2005; 2008). To create these best practice videos, training supervisors chose footage among linemen that displayed best practices for each of the five steps. All linemen were shown a video from a different subsidiary, to reduce the possibility that these videos may trigger peer effects that could affect motivation. The videos included no instruction or verbal audio of any kind, simply enabling the observation of linemen. It provided some text to signpost the step that was being executed (screenshots shown in Appendix Figure A.2).

[INSERT TABLE 1 HERE]

These two treatment arms were cross-randomized to result in four experimental conditions: *Control*, *Multiple Goals*, *Best Practice*, and *Best Practice + Multiple Goals*. The videos were stitched together for treatment conditions such that every linemen pair watched only a single video. After watching their assigned video, linemen pairs performed their second round of grounding evaluations. Table 1 shows that randomization produced balanced samples across experimental conditions, with no economically or statistically significant differences across linemen on observable characteristics. There was no attrition or non-compliance.

Each subsidiary had its own training center and set of training supervisors (a total of nine across the three subsidiaries), and each linemen pair was assigned to the training supervisor in their subsidiary who was scheduled for the day that they were assigned to in each round. Training supervisors were blind to experimental conditions and details. Each pair had a unique video number assigned to view inside the training center, and evaluations were conducted outside on training grounds.

5. ECONOMETRIC MODEL

To evaluate the impact of multiple goals on linemen performance, I estimate average treatment effects using the following regression model:

$$Y_i = \beta_M Multiple\ Goals_i + \beta_B Best\ Practice_i + \beta_{BM} Best\ Practice_i * Multiple\ Goals_i + \gamma Y_{i,t=0} + \delta_i + \varepsilon_i$$

Y_i represents the outcomes of interest for linemen pair i, which include the time taken and the overall safety score for both the full procedure and the specific step on which they were given feedback.

$Y_{i,t=0}$ controls for the baseline value of the outcome variable, and δ_i is a randomization stratum indicator – neither of which are necessary for identification but help absorb noise. ε_i is an idiosyncratic error term.

In this model, β_M, β_B and β_{BM} are the coefficients of interest. β_M estimates the effect of the *Multiple Goals* treatment compared to the *Control*, evaluating the impact of communicating multiple goals (both safety and efficiency) to linemen pairs compared to a single goal of safety. β_B identifies the impact of providing best practice observation.. β_{BM} estimates the differential effect of combining both the *Multiple Goals* and *Best Practice* treatments, identifying how the impact of multiple goals varies when combined with best practice observation.

I additionally assess the robustness of results across alternative specifications, including a simple comparison in means, as well as a difference-in-differences model. Standard errors are clustered at the pair level, the unit of randomization, for all specifications (Abadie et al., 2017).

6. THE IMPACT OF MULTIPLE GOALS

At baseline, linemen pairs showed a large dispersion in their efficiency and safety, with a long tail of both unsafe and inefficient linemen – suggesting that at least some linemen may be inside the productivity frontier.

After treatment, linemen pairs assigned to pursue multiple goals alone (*Multiple Goals)* improved their efficiency without sacrificing their safety, compared to those assigned to pursue safety alone *(Control)*. Consistent with the interpretation that less safe and less efficient linemen may be inside the productivity frontier, these linemen were more likely to improve on both goals. Moreover, best practice observation (*Best Practice*) improved linemen's efficiency and safety on average, suggesting that more linemen may have been inside the productivity frontier. However, when paired with best practice observation (*Best Practice + Multiple Goals),* multiple goals dissipated any improvements in both safety and efficiency compared to *Best Practice* or *Multiple Goals* alone.

6.1 Baseline variation in efficiency and safety

Linemen pairs showed a large dispersion in their baseline efficiency and safety. The variation in efficiency ranged from thirty minutes to two hours, implying that the top percentile of pairs took a third of the time taken by the bottom percentile (Figure 3(a)). Safety scores also ranged from 12 to 25, indicating that more than 10% of linemen failed to meet the minimum safety criteria of 15 required to continue working as a fully-functioning employee (Figure 3(b)).

Notably, not all slow pairs were safe, or unsafe pairs fast—rather, a substantial number appeared to be both inefficient and unsafe. Plotting every pair by baseline time and safety score reveals three groups: underperforming pairs who were both inefficient and unsafe compared to the mean, pairs who were either safe but inefficient, or efficient but unsafe, and pairs who were both more efficient and safe

(Figure 3 (c)). There is also one pair who received both the highest safety score of 25 and took the shortest time of 29.92 minutes, suggesting that other linemen pairs may be inside the productivity frontier. This is consistent with growing evidence that many firms may be far from the productivity frontier in their practices (Syverson, 2004; Bloom & Van Reenen, 2007; Bloom et al., 2013), and provides complementary evidence of a large dispersion in practices even within a large multinational firm in the Fortune 500.

What might explain why some linemen are far from the productivity frontier? Evidence from research on knowledge transfer and market frictions suggests many possible reasons. First, there may have been information frictions stemming from silos within the organization, or methods and tools used in transferring knowledge (Szulanski 1996, Zander and Kogut 1995, Darr et al 1995, Argote and Miron-Spektor 2011). Second, there may have been implementation challenges even in the absence of information frictions, as proposed by Gibbons and Henderson (2013), such as the receptibility of employees to share, receive, and implement best practices. Finally, labor market constraints may have prevented the firm from selecting out employees with poor outcomes, for example due to agreements with stakeholders like unions, or adjustment costs that make any immediate action unlikely to be optimal.

6.2 The impact of multiple goals

[INSERT TABLE 2 AND FIGURE 4 HERE]

Compared to linemen in the *Control* group, linemen pairs assigned to *Multiple Goals* showed higher efficiency, as expected. Figure 4 shows that the *Multiple Goals* treatment not only improved the average efficiency, but also shifted the entire distribution of linemen to the left, decreasing the time they took. The first two rows of Table 2 columns (1) - (2) indicate that this improvement was an 11% decrease (p=0.001) on average compared to the *Control* group, who took 64 minutes.[13]

[INSERT FIGURE 5 HERE]

This improvement in efficiency did not come at a significant cost to safety. The treatment effect estimate of *Multiple Goals* in Table 2 suggests that linemen also received higher safety scores by 1%, which is imprecisely estimated (p=0.56).[14] Figure 5 shows that the majority of linemen in fact improved in both efficiency and safety. Given that safety and efficiency are unlikely to have a natural positive complementarity in this setting, this result along with the large dispersion of linemen performance at baseline raises the possibility that linemen on average may have been inside the productivity frontier.

[INSERT TABLE 3 HERE]

[13] Given the slight skew in both variables, I show these results with the raw outcomes as well as the natural log transformation. There are no zeros in either variable, and taking the natural log of the variable generates a more normal distribution.

[14] I was powered to detect a difference of 4% in a comparison of simple means.

Consistent with the interpretation that multiple goals may help linemen inside the productivity frontier move closer to the frontier, linemen assigned to *Multiple Goals* who were slower and less safe at baseline were more likely to improve on both efficiency and safety.[15] Linemen pairs who were slower and less safe at baseline were 23% (p=0.039) more likely to show an improvement in both dimensions when assigned to *Multiple Goals*—a larger and more precise estimate compared to other subgroups (Table 3).

These results provide evidence consistent with the interpretation that pursuing multiple goals in this case pareto-improved linemen's performance, contrary to theoretical predictions that multiple goals will result in confusion and reduce performance (Jensen, 2002). They provide suggestive evidence that the effect of multiple goals may depend on where employees are relative to the productivity frontier.

6.3 The impact of multiple goals with best practice observation

[INSERT FIGURE 6 HERE]

Consistent with the interpretation that linemen were inside the productivity frontier and best practice observation enabled them to learn and improve, linemen pairs assigned to *Best Practice* showed improvements in both safety and efficiency compared to the *Control* group. Figure 6 shows that the entire distribution of linemen was shifted to the left for efficiency, decreasing the time they took, and shifted to the right for safety, improving their safety. Table 2 Columns (1)-(2) and (4)-(5) show that these represented a 7% improvement in efficiency (~4min; p=0.046) and a 3% improvement in safety (0.6 points; p=0.026) on average.[16] This suggests that more linemen than just those who were less safe and slower relative to the mean may have been inside the frontier, consistent with the positive average effect of *Multiple Goals* and the fact that a linemen pair at baseline achieved both the highest safety score and the highest efficiency.

Interestingly, improvements from *Best Practice* were larger and more precisely estimated for linemen pairs who were safer and faster at baseline—indicating that higher-performers may have benefitted more from best practice observation. These higher-performing pairs assigned to *Best Practice* were 49% (p=0.043) more likely to show an improvement in both safety and efficiency relative those assigned to the *Control* group. While linemen pairs in other subgroups also improved in both indicators from *Best Practice*, these improvements were smaller (9-11%) and less precisely estimated (p=0.377; p=0.508). This result is consistent with the broader idea of absorptive capacity that the ability to assimilate and apply new external information depends on the baseline capabilities of the unit (Cohen and Levinthal 1990, Zahra and George 2002), and provides some suggestive

[15] Exploring heterogeneity in treatment effects by whether linemen pairs were above/below median efficiency or above/below median safety provide qualitatively consistent results.
[16] Note that Log time is estimated in logs, so that the percentage reduction is -0.07 = exp(-0.07) – 1

evidence that information frictions within the organization may have slowed down the diffusion and adoption of best practices across the firm.

[INSERT FIGURE 7 HERE]

Despite the positive effects of both treatments when assigned on their own, improvements dissipated when they were combined in *Best Practice + Multiple Goals*. Figure 7 shows that compared to linemen who received *Best Practice* alone (in green), linemen assigned to *Best Practice + Multiple Goals* (in blue) took longer and received lower safety scores across the entire distribution, suggesting that they did not benefit from the best practice observation. They were also slower and less safe compared to linemen assigned to *Multiple Goals* alone (in red), with efficiency reductions manifesting along the entire distribution. These represented an efficiency decrease of 23% (13min; $p<0.001$), and a safety deterioration of 4% (0.6 points; $p=0.078$) (Table 2), essentially dissipating any gains from either of the two treatments when implemented alone. There was little evidence of significant heterogeneity in treatment effects, with both safer and faster as well as slower and less safe linemen pairs showing lower performance when assigned to *Best Practice + Multiple Goals* (Table 3)—suggesting that what dissipated these improvements may have applied similarly across all linemen pairs.

[INSERT FIGURE 8 HERE]

Together, these findings suggest that communicating multiple goals may depend on where employees are on the productivity frontier, and that while best practice observation may help move employees closer to the frontier, combining it with multiple goals communication may dissipate potential gains from either intervention. These results are robust to different econometric models (Figure 8, Appendix Table 4), as well as to evaluating linemen performance on the specific step on which they received feedback (Appendix Table 1) and including step and supervisor fixed effects (Appendix Table 2).

7. WHY DO MULTIPLE GOALS DISSIPATE GAINS WHEN PAIRED WITH BEST PRACTICE OBSERVATION?

The findings described in the previous section indicate that communicating multiple goals alone Pareto-improved performance, but dissipated gains from both multiple goals and best practice observation when paired together. The natural question this raises is why. While I cannot precisely pin down the mechanism from empirical evidence, there are a few potential explanations that can be ruled out or that are unlikely given the experimental design and contextual details.

First, any explanation relating to the potentially negative effects of the best practice video alone can be ruled out given the performance-enhancing impact of *Best Practice*. For example, if this effect were driven by the fact that the best practice video was unclear or poor in quality, then the effects of *Best Practice* alone should have also been negative, but in contrast, it improved both linemen's safety

and efficiency. Relatedly, while the best practice observation may have affected motivation by triggering peer effects in addition to knowledge transfer, these effects appear to have been positive overall (or outweighed by other positive effects) given that *Best Practice* improved both linemen's safety and efficiency, consistent with evidence of positive productivity spillovers from peer effects found in other settings (e.g., Mas and Moretti 2009, i Vidal and Nossol 2011).

Similarly, any explanation driven by the negative effects of multiple goals alone can be ruled out. For example, a common explanation for negative performance effects from multiple goals is direct tradeoffs between goals (Etzioni, 1964; Holmstrom & Milgrom, 1991; Meyer, 2002; Zbaracki & Bergen, 2010). A related explanation is that the presence of goal interdependence—that a single action can have implications for multiple goals simultaneously—makes it impossible for an employee to disentangle which action leads to performance improvements and choose one (e.g. Ethiraj & Levinthal, 2009). However, these explanations are inconsistent with evidence on the positive effects of both *Multiple Goals* and *Best Practice* when assigned alone. If tradeoffs or goal interdependence drove the observed effects, then linemen assigned to *Multiple Goals* alone should have shown a decrease in performance compared to the *Control* group. Instead, linemen assigned to *Multiple Goals* showed improvements in efficiency with many pairs improving on both dimensions, and linemen assigned to *Best Practice* alone also improved in both safety and efficiency – suggesting that they did not face tradeoffs and were able to choose actions that improved on both goals.

Third, given that all videos focused on the step that the linemen pair performed worst on at baseline, it could be that the videos assigned in *Best Practice + Multiple Goals* compared to the other conditions happened to target more difficult steps. However, as expected from randomization and the balance check, the distribution of feedback steps across experimental conditions was not statistically or economically significantly different (Appendix Figure 4). Furthermore, the results are robust to controlling for the step shown in the video (Appendix Table 2).

Fourth, it could be that the *Best Practice + Multiple Goals* treatment was too long or incoherent compared to the other videos. While this is possible, it seems less likely given the context. First, the *Best Practice + Multiple Goals* videos were on average 21 seconds longer than the *Best Practice* videos. Second, the *Best Practice + Multiple Goals* videos simply stitched together the *Multiple Goals* and the *Best Practice* videos, and all videos were vetted by multiple levels across the company. The head of the training team along with two of his team members, the head of all field operations, the head of safety, Director of Planning and Engineering, and the Vice President of Operations all oversaw the process and vetted them as appropriate training assets to help linemen improve. Many of these individuals had been involved in training and development for several years and had previously worked as linemen, providing them with deep knowledge and experience. Third, linemen assigned to *Best Practice + Multiple Goals* did not display a lower likelihood of executing the correct sequence of steps as

highlighted in the video, suggesting that they were not less likely to attend to the information provided (Appendix Table 5).

This leaves a few possible explanations that relate to how multiple goals may interact with best practice observation. One possible explanation is that the task of improving from best practice observation and pursuing on multiple goals is simply much harder compared to focusing on multiple goals alone or absorbing information from best practice observation alone, triggering cognitive overload. There may be specific ways in which this cognitive overload might arise, for example due to multiple goals triggering a perception of tradeoffs, thus cognitively hindering information processing from best practice observation. Theory on multiple goals has proposed that performance feedback on multiple goals increases complexity and confusion due to potential interdependencies (Hu and Bettis 2018, Ethiraj and Levinthal 2009), which may also stem from simply perceiving tradeoffs even if they may not exist. Moreover, much work has highlighted how higher complexity and causal ambiguity can lead to incorrect inferences by decision-makers (Rivkin, 2000; Zollo & Reuer, 2010; Gupta et al., 2015), and making multiple goals salient may further exacerbate the challenge of inferring cause-and-effect relationships and drawing appropriate inferences from observing others (Lippman & Rumelt, 1982; Zander & Kogut ,1995; Ryall 2009). This interpretation is broadly consistent with growing literature on paradox theory, which suggests that those primed with a closed mindset are less able to resolve tradeoffs compared to those who are not (Miron-Spektor et al., 2018; Smith & Lewis, 2011).

Another possible explanation is that while employees can improve on multiple goals inside the frontier, this is not guaranteed, and flexibility is important to help them move closer to the frontier. Best practice observation may limit possible actions by providing a template, and it may be that improving on multiple goals requires flexibility to help employees move in the direction that is closer to the frontier and improves on both goals.

Both of these explanations could broadly explain the observed negative effects of *Best Practice + Multiple Goals,* as well as the limited heterogeneity across linemen in these effects, given that neither cognitive factors nor the operational importance of flexibility may necessarily be dependent on prior performance.

While evidence from the experiment is unable to precisely identify the underlying mechanism, information gathered in the field provides suggestive evidence consistent with the interpretation that the combination of multiple goals and best practice observation may have been more difficult, possibly because it primed a mindset of tradeoffs that hindered information processing. Linemen pairs assigned to *Best Practice + Multiple Goals* uniquely commented that they did not find the video helpful, with no similar comments from pairs assigned to other conditions. These pairs elaborated that it was not clear how to determine from the best practice videos what they might do to ensure they improved on both goals, as certain actions could improve one goal while worsening the other. One comment echoed by others described, “I observed some things from the best practice video that I could do, but

didn't know if I should try it because it could increase safety but make me slower…so I didn't know what to change from what I was doing." Another explained, "I don't know what to take away from this best practice video, because anything I try won't help me get both safer and faster. I don't know how everything is going to balance out in the end." Many highlighted the tradeoffs they believed were present, which appeared to broadly represent the view of most employees. For example, one lineman articulated, "Taking safety steps takes more time. The job safety analysis, and considering all risks takes time. All of this adds to the task time." Some linemen pairs also expressed that clear and concrete guidance on steps would be helpful in improving their procedure. While speculative, this qualitative evidence paired with the findings of the experiment proposes that the multiple goals may have complicated the processing of information from best practice observation.

Conversations with managers one year after the experiment provided consistent insights suggesting that the effects from training may not have been short-term. The head supervisor commented, "To me it is clear that linemen improve[d] their skills or did not…as a result of training. […] Performance in the second round showed what linemen could do as a result of more [and different] training, which did not change outside the training center." He elaborated that it was difficult for those who had not performed well because "You can only be more efficient…and be safer [when] you have the proper training and execute [that] so many times as possible," and highlighted that these linemen had to be brought back into the training center to be retrained. Employees were also monitored during their daily work as in the training center, which may have contributed to consistent behavior inside and outside the training center.

Consistent with these observations, the company did not move forward with the best practice observation in their training, and moved forward by communicating both safety and efficiency. They implemented a different way to transfer best practices by having supervisors demonstrate every detailed step slowly while providing specific and detailed instructions.

8. EXTERNAL VALIDITY

The key motivation behind this experiment was to establish a high degree of internal validity to provide a test of the causal effects of multiple goals (List 2020). In this sense, this setting provides a unique opportunity within a large energy corporation, where both single and multiple goals can be communicated credibly and naturally, randomization can be ensured without non-compliance or interference, and both outcomes can be measured precisely with full monitoring to limit measurability issues. However, these features also make this setting particular. While these findings are more likely to be applicable to similar settings involving frontline workers who carry out activities with multidimensional objectives, how far they apply is an open question for future work.

Three key criteria provide insight on how generalizable a field experiment may be (List 2020): (1) the selection of the sample that may affect responses to treatment; (2) the degree of attrition and

non-compliance suggesting issues that could limit compliance in other settings; (3) the naturalness of the choice task, setting, and time frame that influences how interchangeable the nature of choice is between the research setting and target settings.[17]

On selection, there are three important factors to consider. First, this study examines pairs of linemen, which may provide different results than for individuals or larger teams. It is likely that larger units have more difficulty coordinating efforts and learning, meaning that improvements in both goals may be harder to obtain across teams larger than pairs, and the negative effect of best practice observation and multiple goals may be even larger. Second, the study examines the goals of safety and efficiency. Safety and efficiency may be different in nature than other goals, and may also work differently in settings where these goals are less measurable compared to this context. Moreover, the findings may not generalize to more than two goals. Given the increasing complexity with each added goal, figuring out how to improve and move closer to the productivity frontier may be increasingly difficult with more goals even when employees are inside the frontier. Third, these findings are most indicative of how multiple goals affects employee performance, rather than organizational performance.

On the latter two criteria, the study suggests a higher level of external validity. There is no attrition or non-compliance, and the nature of choice is nearly unchanged between the research setting and target settings. Employees in their regular work evaluations are provided with communication on multiple goals, and make decisions with no artificial constraints imposed, where their outcomes are simply observed and recorded. An important consideration is that this experiment occurred in a training context rather than everyday work. While in this company context, monitoring and the stakes involved in the training evaluation were similar to everyday work, this may have different effects in other settings: it might decrease the magnitude of effects in cases where training evaluations do not have high stakes, or increase the magnitude in cases where everyday work does not involve monitoring or incentives. Furthermore, more precise measurement of longer-term outcomes may provide different insights.

9. DISCUSSION AND CONCLUSION

This paper explores the impact of multiple goals on employee performance, using a field experiment that varied the articulation of goals to frontline employees in an energy corporation. The findings suggest that the impact of multiple goals may vary depending on where employees are relative to the productivity frontier: it can have positive effects for employees inside the frontier who can improve on multiple dimensions without tradeoffs. Furthermore, the findings raise the possibility that

[17] List raises a fourth criteria for programmatic studies targeted to policymakers: what the factors would be that would affect who should receive the program, how it should be implemented, and whether this would pass a benefit vs. cost test if implemented at scale. Given that this last criteria does not apply to this study, which does not propose an intervention for policymakers, I assess the study according to each of the first three criteria.

multiple goals may negatively impact learning from best practice observation – suggesting that firms may need to be cautious about using best practice observation in settings with multiple goals.

These results stem from a particular company, and are most likely to generalize across similar settings involving frontline workers who carry out activities with multidimensional objectives. A fruitful area for future work may be to explore the extent to which these results may generalize across a broader set of contexts and over a longer time period.

These findings point to two managerial implications. First, they suggest that in determining whether to communicate multiple goals, managers need to consider the performance of each employee and where they may be relative to the productivity frontier. Second, these findings indicate that best practice information may not always be useful in settings that are naturally multi-dimensional. While firms increasingly have access to data that document practices across their own organization as well as other companies, these findings raise the possibility that firms may need to approach this carefully, as providing more observation-based information to employees may in some cases dissipate learning.

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TABLE 1: Descriptive statistics and balance of variables

Panel A: Descriptive Statistics

	mean	sd	min	p50	max	count
Baseline Time Taken	66.28	16.21	29.92	64.30	118.68	270
Baseline Safety Score	17.63	2.42	12.00	18.00	25.00	270
Baseline Correct Sequence	0.75	0.43	0.00	1.00	1.00	270
Baseline Feedback Given	0.34	0.47	0.00	0.00	1.00	270

Panel B: Balance of Variables

	Control	Multiple Goals	Best Practice	Best Practice + Multiple Goals
Baseline ln(Time Taken)	4.17	4.12	4.18	4.18
	(0.03)	(0.03)	(0.03)	(0.03)
Baseline ln(Safety Score)	2.86	2.85	2.88	2.86
	(0.02)	(0.02)	(0.02)	(0.02)
Baseline Correct Sequence	0.75	0.75	0.78	0.72
	(0.05)	(0.05)	(0.05)	(0.05)
Baseline Feedback Given	0.40	0.33	0.31	0.32
	(0.06)	(0.06)	(0.06)	(0.06)
Days Since Baseline	125.96	123.64	126.52	123.60
	(3.27)	(4.04)	(3.66)	(3.39)
Feedback Step	3.40	3.54	3.30	3.43
	(0.15)	(0.13)	(0.16)	(0.15)
F-statistic p-value		0.63	0.95	0.96
Observations	68	67	67	68

Panel (A) provides summary statistics on all baseline characteristics of linemen pairs. Time Taken takes the natural log of the amount of time taken by linemen to finish the grounding procedure at baseline. Safety Score takes a natural log of a measure of the degree to which linemen executed the procedure safely. Correct Sequence indicates whether the procedure sequence was executed correctly. Feedback given indicates whether any immediate feedback was provided in the first round. Panel (b) shows the balance of variables at baseline between experimental conditions, displaying the mean of each variable by condition and standard errors in parentheses. The F-statistic p-value displays the p-value of the F-test for joint significance comparing each treatment separately to the control.

TABLE 2: Average treatment effects

	(1)	(2)	(3)	(4)
	Time Taken	ln(Time Taken)	Safety Score	ln(Safety Score)
Multiple Goals	-7.02	-0.11	0.14	0.01
	(2.09)	(0.03)	(0.27)	(0.02)
Best Practice	-4.09	-0.07	0.57	0.03
	(2.20)	(0.03)	(0.25)	(0.01)
Best Practice + Multiple Goals	12.99	0.21	-0.62	-0.04
	(3.13)	(0.05)	(0.37)	(0.02)
Strata FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	270	270	270	270
Mean (control)	63.79	4.13	19.00	2.94
SD (control)	14.99	0.23	1.66	0.10

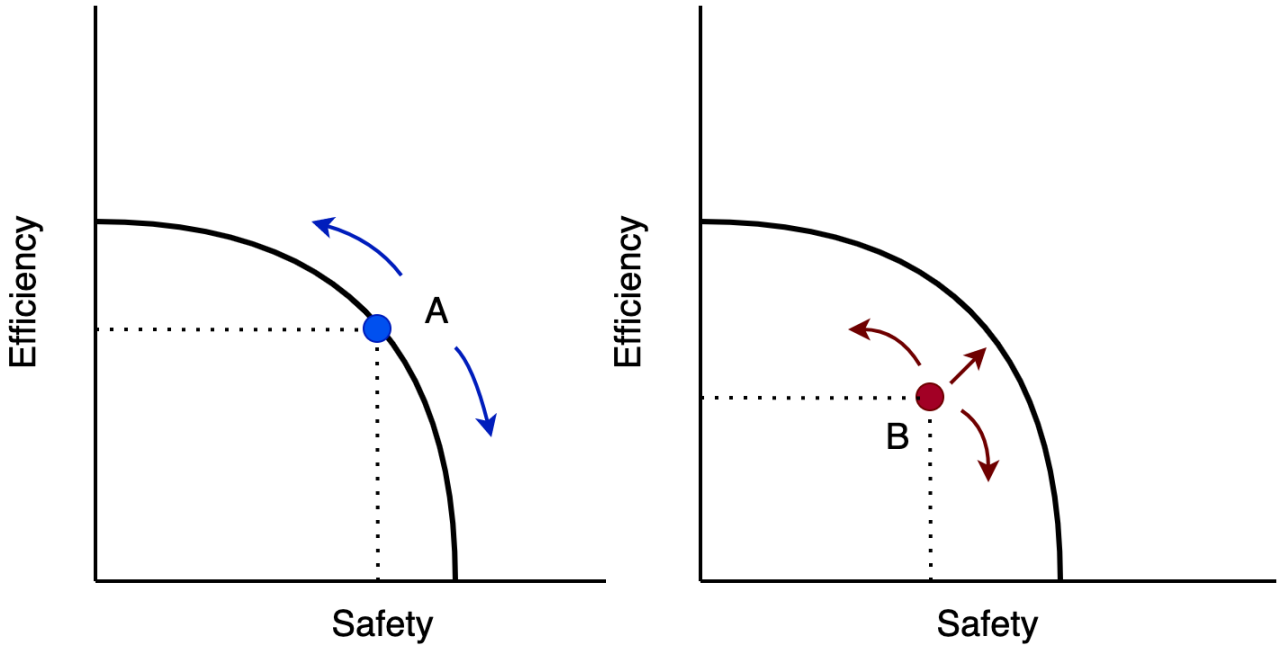
This table shows intention to treat estimates relative to the *Control* group. Observations are at the linemen pair level. The dependent variable for each regression is indicated at the top of the column: *Time Taken* measures the total number of minutes taken to complete the procedure; *Safety Score* is the assigned score using the company's internal rubric. *Controls* include the baseline value of the outcome variable.

TABLE 3: Improvement in both efficiency & safety by baseline outcomes

	Improvement in Both Efficiency and Safety		
	(1) Safer and Faster	(2) Safer but Slow, or Faster but Less Safe	(3) Slower and Less Safe
Multiple Goals	0.01	0.12	0.23
	(0.16)	(0.13)	(0.11)
Best Practice	0.49	0.11	0.09
	(0.16)	(0.13)	(0.14)
Best Practice + Multiple Goals	-0.48	-0.09	-0.41
	(0.23)	(0.18)	(0.18)
Constant	0.22	0.35	0.74
	(0.15)	(0.11)	(0.11)
Strata FE	Yes	Yes	Yes
Observations	65	122	83

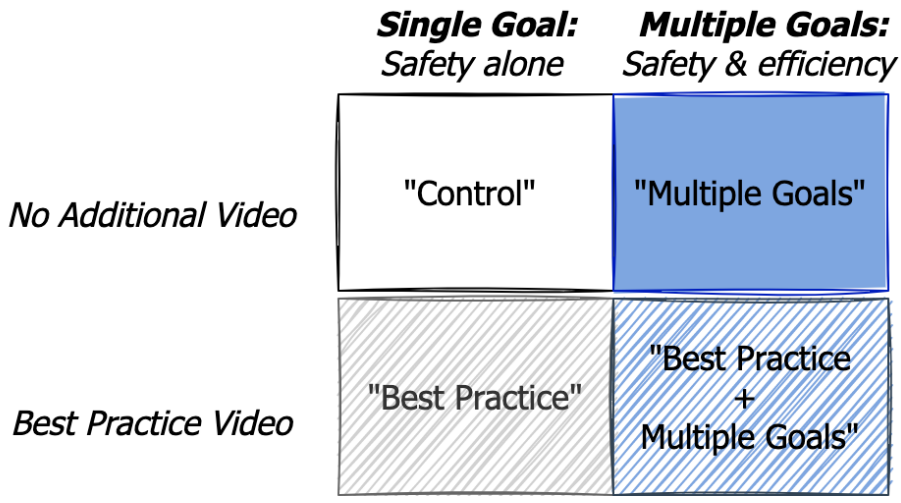
This table shows intention to treat estimates by subgroups based on the linemen pair's baseline quadrant. Observations are at the pair level. The dependent variable for all regressions is a binary indicator for whether both efficiency and safety improved (i.e. equal to or greater than zero). Column 1 shows results for linemen who were safer and faster relative to the mean at baseline; Column 2 shows results for linemen who were in one of two baseline quadrants: safer but slow, or faster but less safe, both relative to the mean; Column 3 shows results for linemen who were slower and less safe relative to the mean at baseline. All regressions control for randomization strata fixed effects.

FIGURE 1: Tradeoffs on vs. inside the productivity frontier



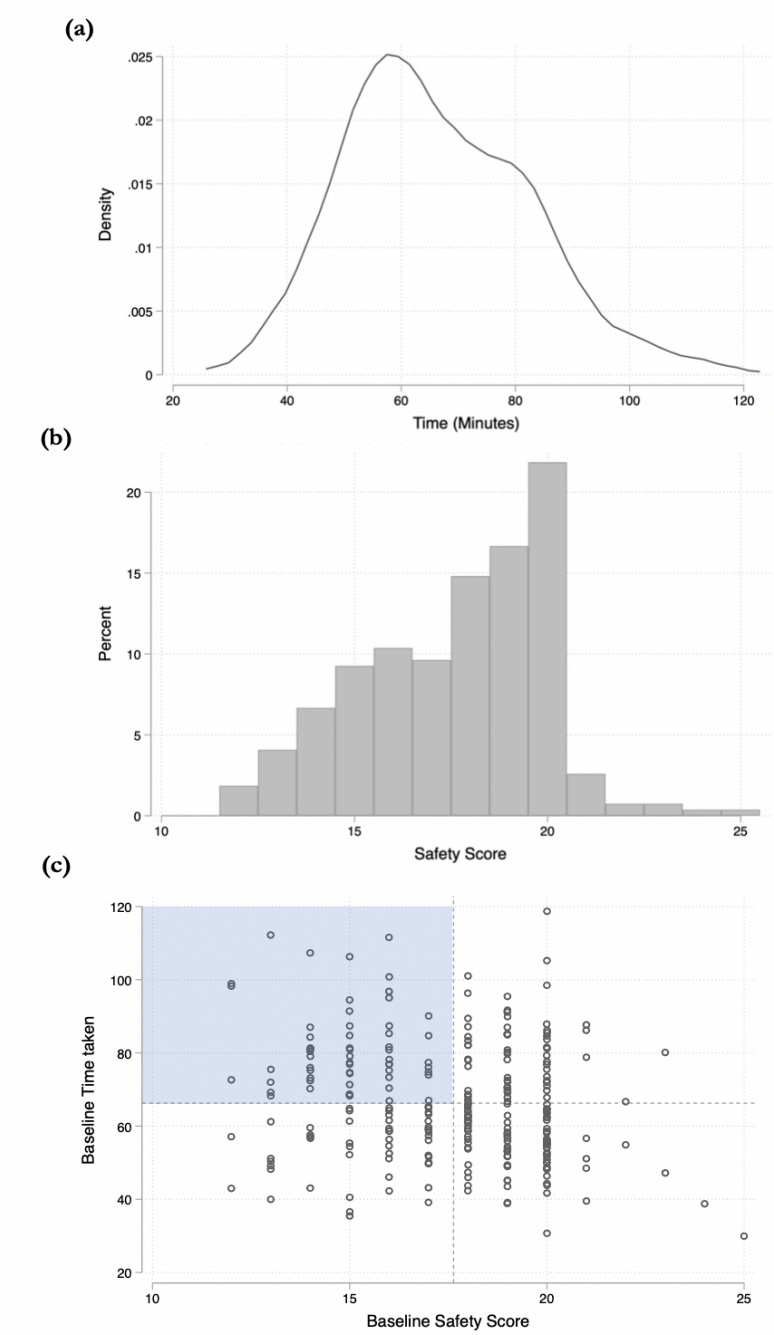
Notes: This figure sketches a productivity frontier, where A shows a point on the frontier, and B indicates a point inside the frontier.

FIGURE 2: Experimental design



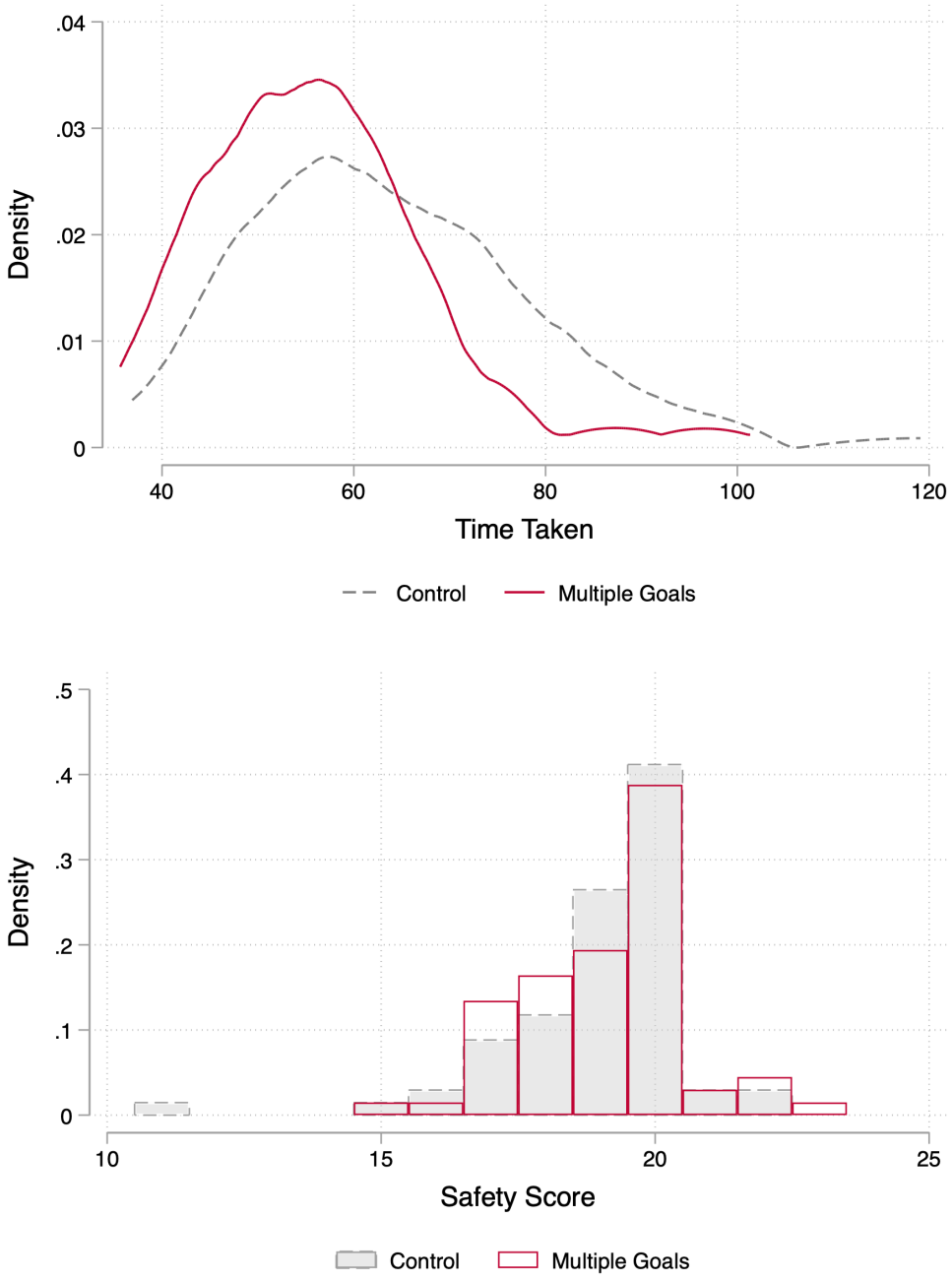
This figure shows the four experimental conditions, which randomized two treatment arms: (1) the number of goals communicated and (2) whether the best practice video was provided.

FIGURE 3: Baseline variation in time and safety



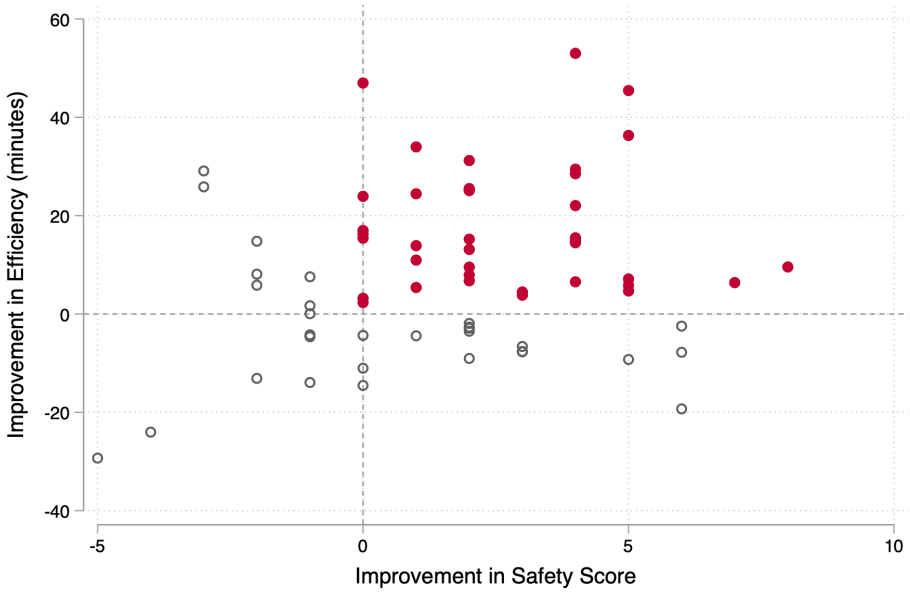
The top two figures (a) and (b) plot the baseline distribution of linemen pairs' times and safety scores for the grounding procedure. The bottom figure (c) plots the relationship between time and safety. Specifically, (c) plots every linemen pair, highlighting four quadrants: those that are less efficient and less safe compared to the average (top left, highlighted); those that are safer but less efficient, or more efficient but less safe (top right and bottom left), and those that are safer and more efficient compared to the mean (bottom right).

FIGURE 4: Average treatment effects of multiple goals



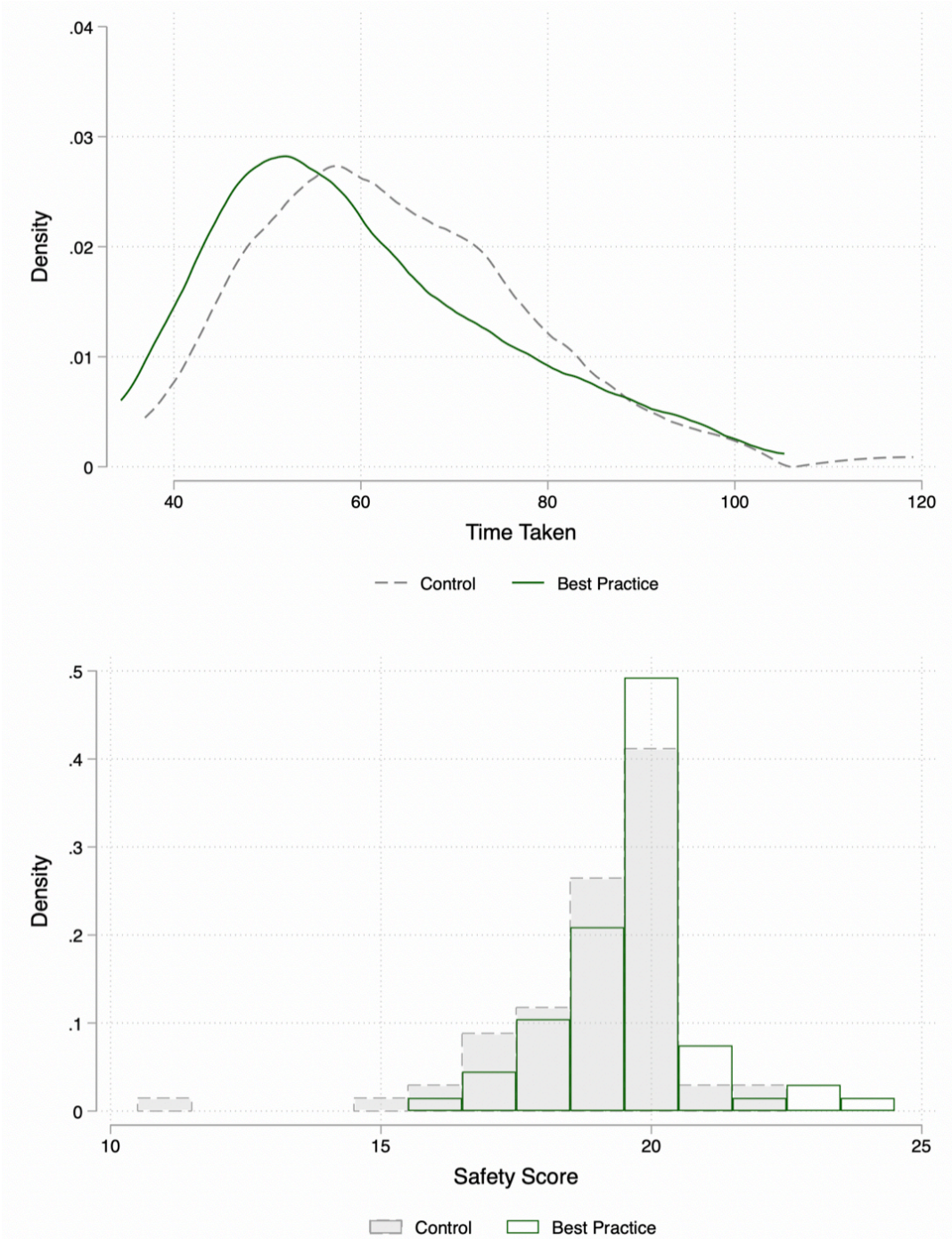
These figures plot the distribution of linemen pairs' times and safety scores in *Multiple Goals* compared to those in the *Control* group. Two-sample Kolmogorov-Smirnov tests for equality of distribution: Time: 0.004; Safety: 1.0.

FIGURE 5: Improvements in safety and efficiency across linemen pairs assigned to *Multiple Goals*



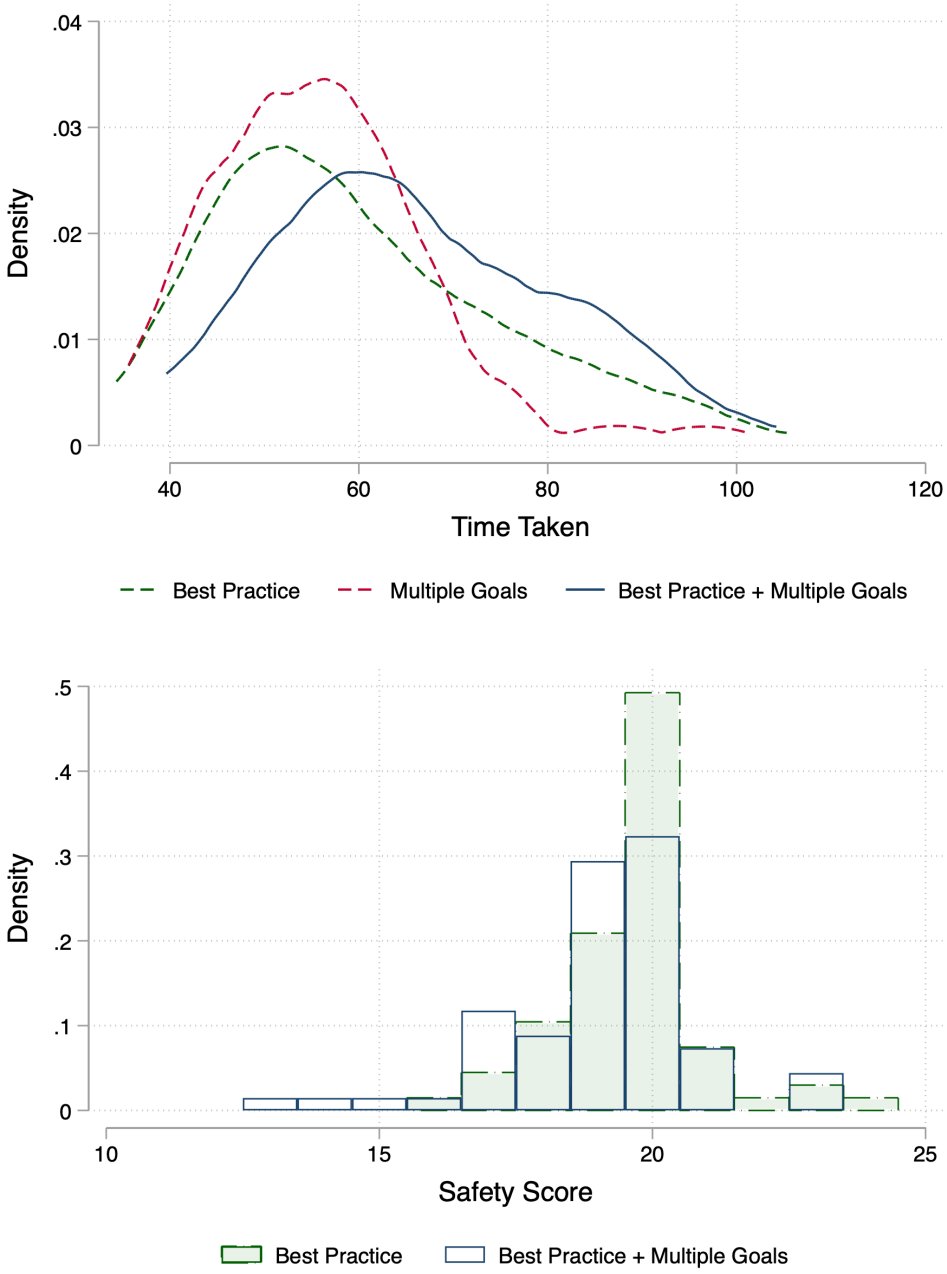
This figure plots each linemen pair by their improvement in efficiency (how much they reduced their time taken compared to baseline) and safety (how much they increased their safety score compared to baseline) – within the experimental condition "Multiple Goals." Negative values indicate that linemen worsened compared to baseline.

FIGURE 6: Average treatment effects of best practice information



These figures plot the distribution of linemen pairs' times and safety scores in *Best Practice* compared to those in the *Control* group. Two-sample Kolmogorov-Smirnov tests for equality of distribution: Time: 0.22; Safety: 0.38.

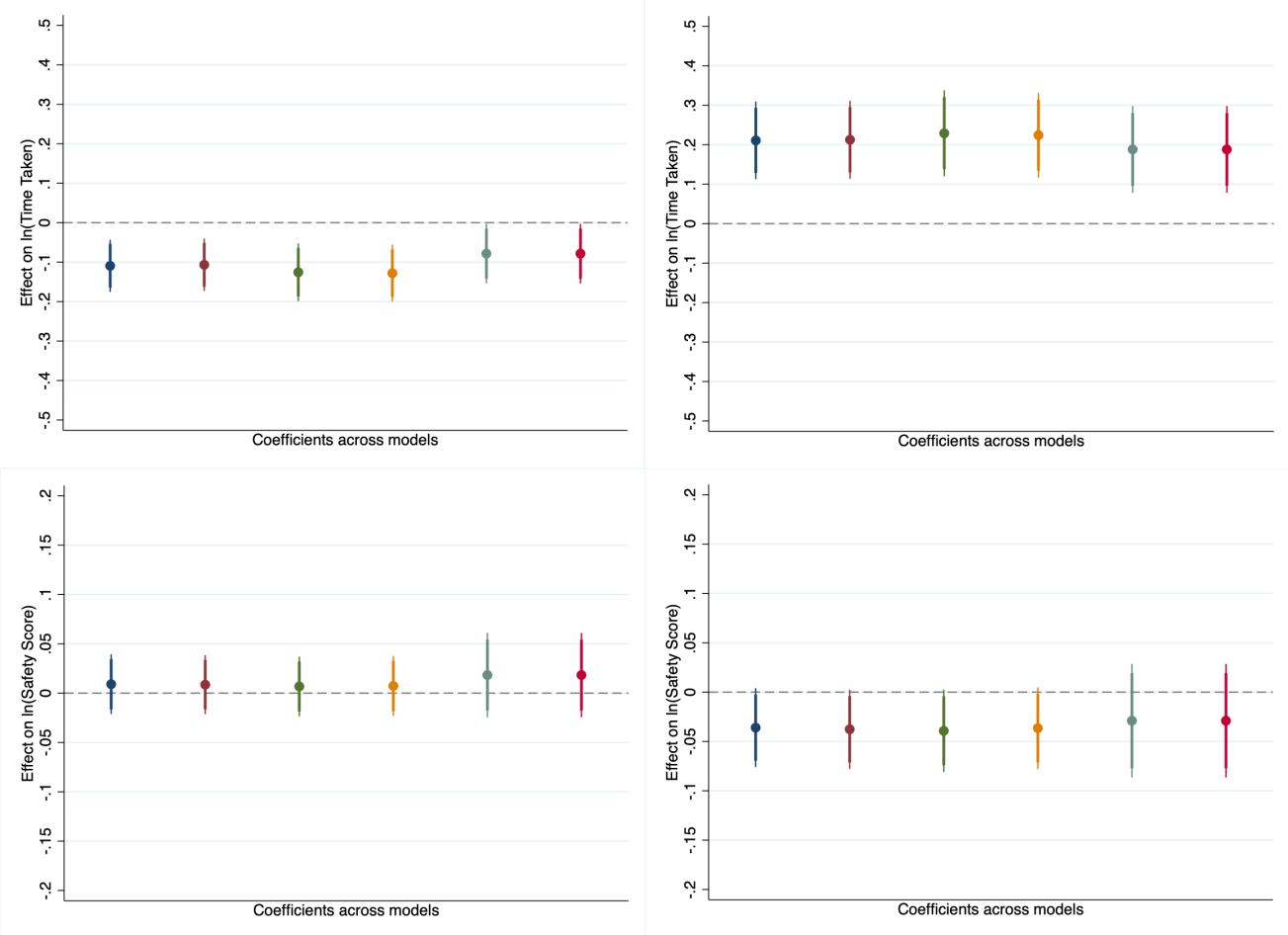
FIGURE 7: Average treatment effects of multiple goals + best practice



These figures plot the distribution of linemen pairs' times and safety scores in *Best Practice + Multiple Goals* compared to those in *Best Practice* (without Multiple Goals) in Round 2. Two-sample Kolmogorov-Smirnov tests for equality of distribution compared to *Best Practice*: Time: 0.01; Safety: 0.195.

FIGURE 8: Robustness of effects across econometric models

(a) The effect of *Multiple Goals* (b) The effect of *Best Practice + Multiple Goals*



These figures plot treatment effect estimates on time taken (row 1) and safety (row 2) across different possible econometric models. The left column (a) plots the effects of *Multiple Goals*, while the right column (b) plots the effects of *Best Practice + Multiple Goals*. The first two coefficients in each figure come from the specification reported in the main text, with the first including the randomization stratum indicator and the second excluding it. The third and fourth coefficients estimate simple means of each outcome, with and without the randomization stratum indicator. The fifth and sixth models estimate coefficients from a difference-in-difference in model, with and without the randomization stratum indicator.

Online Appendix

Appendix Table 1: Robustness of average treatment effects across outcome variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Time Taken	ln(Time Taken)	ln(Time Taken on Step)	Improve-ment in Time	Safety Score	ln(Safety Score)	ln(Safety Score on Step)	Improve-ment in Safety
Multiple Goals	-7.79	-0.13	-0.15	5.49	0.10	0.01	-0.02	0.29
	(2.34)	(0.04)	(0.10)	(2.72)	(0.27)	(0.02)	(0.03)	(0.46)
Best Practice	-3.82	-0.07	0.02	4.76	0.64	0.04	0.05	0.29
	(2.63)	(0.04)	(0.11)	(2.53)	(0.26)	(0.01)	(0.03)	(0.44)
Best Practice+ Multiple Goals	13.95	0.23	0.24	-11.84	-0.69	-0.04	-0.03	-0.48
	(3.52)	(0.06)	(0.14)	(3.91)	(0.38)	(0.02)	(0.04)	(0.62)
Strata FE	No	No	No	No	No	No	No	No
Controls	No	No	No	No	No	No	No	No
Observations	270	270	270	270	270	270	270	270
Mean (control)	63.79	4.13	2.24	2.64	19.00	2.94	1.32	1.40
SD (control)	14.99	0.23	0.58	14.86	1.66	0.10	0.16	2.65

This table shows intention to treat estimates for each treatment relative to the *Control* group. Observations are at the linemen pair level. The dependent variable for each regression is indicated at the top of the column: *Time Taken* measures the total number of minutes taken to complete the procedure; *Time Taken on Step* measures the number of minutes taken to complete the step on which they received feedback; *Improvement in Time* measures the change in time relative to baseline; *Safety Score* is the assigned score using the company's internal rubric; *Safety Score on Step* is the assigned safety score for the step on which they received feedback; *Improvement in Safety* measures the change in safety score relative to baseline.

Appendix Table 2: Robustness of average treatment effects with additional controls

	(1)	(2)	(3)	(4)
	ln(Time Taken)	ln(Time Taken)	ln(Safety Score)	ln(Safety Score)
Multiple Goals	-0.11	-0.10	0.01	0.02
	(0.03)	(0.03)	(0.02)	(0.02)
Best Practice	-0.07	-0.05	0.03	0.03
	(0.03)	(0.03)	(0.01)	(0.01)
Best Practice + Multiple Goals	0.21	0.16	-0.04	-0.03
	(0.05)	(0.05)	(0.02)	(0.02)
Strata FE	Yes	Yes	Yes	Yes
Step FE	Yes	Yes	Yes	Yes
Supervisor FE	No	Yes	No	Yes
Controls	Yes	Yes	Yes	Yes
Observations	270	270	270	270
Mean (control)	4.13	4.13	2.94	2.94
SD (control)	0.23	0.23	0.10	0.10

This table shows intention to treat estimates for each treatment relative to the *Control* group, with additional instructor and step fixed effects. Observations are at the linemen pair level. The dependent variable for each regression is indicated at the top of the column: *Time Taken* measures the total number of minutes taken to complete the procedure; *Time Taken on Step* measures the number of minutes taken to complete the step on which they received feedback; *Improvement in Time* measures the change in time relative to baseline; *Safety Score* is the assigned score using the company's internal rubric; *Safety Score on Step* is the assigned safety score for the step on which they received feedback; *Improvement in Safety* measures the change in safety score relative to baseline.

Appendix Table 3: Variation across evaluators

	mean	sd	min	p50	max	count
1						
ln(Time Taken)	4.17	0.21	3.69	4.14	4.66	31
ln(Safety Score)	2.93	0.07	2.77	2.94	3.04	31
2						
ln(Time Taken)	4.08	0.22	3.66	4.07	4.54	42
ln(Safety Score)	2.95	0.06	2.77	2.94	3.04	42
3						
ln(Time Taken)	4.03	0.17	3.87	4.01	4.39	11
ln(Safety Score)	2.92	0.06	2.83	2.94	3.00	11
4						
ln(Time Taken)	4.02	0.22	3.54	4.02	4.46	38
ln(Safety Score)	2.98	0.04	2.83	3.00	3.09	38
5						
ln(Time Taken)	4.20	0.25	3.57	4.19	4.78	63
ln(Safety Score)	2.93	0.07	2.71	2.94	3.00	63
6						
ln(Time Taken)	4.13	0.18	3.98	4.04	4.51	7
ln(Safety Score)	2.80	0.17	2.56	2.83	3.04	7
7						
ln(Time Taken)	3.95	0.17	3.61	3.96	4.28	37
ln(Safety Score)	2.99	0.15	2.40	3.00	3.18	37
8						
ln(Time Taken)	4.14	0.19	3.98	4.09	4.48	6
ln(Safety Score)	2.96	0.03	2.94	2.94	3.00	6
9						
ln(Time Taken)	4.08	0.25	3.64	4.05	4.52	35
ln(Safety Score)	2.98	0.05	2.77	3.00	3.00	35
Total						
ln(Time Taken)	*4.09*	*0.23*	*3.54*	*4.07*	*4.78*	*270*
ln(Safety Score)	*2.95*	*0.09*	*2.40*	*3.00*	*3.18*	*270*

This table shows summary statistics on Time Taken and Safety Score across each evaluator. Time Taken takes the natural log of the amount of time taken by linemen to finish the grounding procedure at baseline. Safety Score takes a natural log of a measure of the degree to which linemen executed the procedure safely. Correct Sequence indicates whether a lineman executed the procedure sequence correctly. Feedback given indicates whether a lineman was given feedback.

Appendix Table 4: Average Treatment Effect Estimated Using Seemingly Unrelated Regressions

	(1)	(2)
	ln(Time Taken)	ln(Safety Score)
Multiple Goals	-0.11	0.01
	(0.03)	(0.01)
Best Practice	-0.07	0.03
	(0.03)	(0.01)
Best Practice + Multiple Goals	0.21	-0.04
	(0.05)	(0.02)
Strata FE	Yes	Yes
Controls	Yes	Yes
Observations	270	270

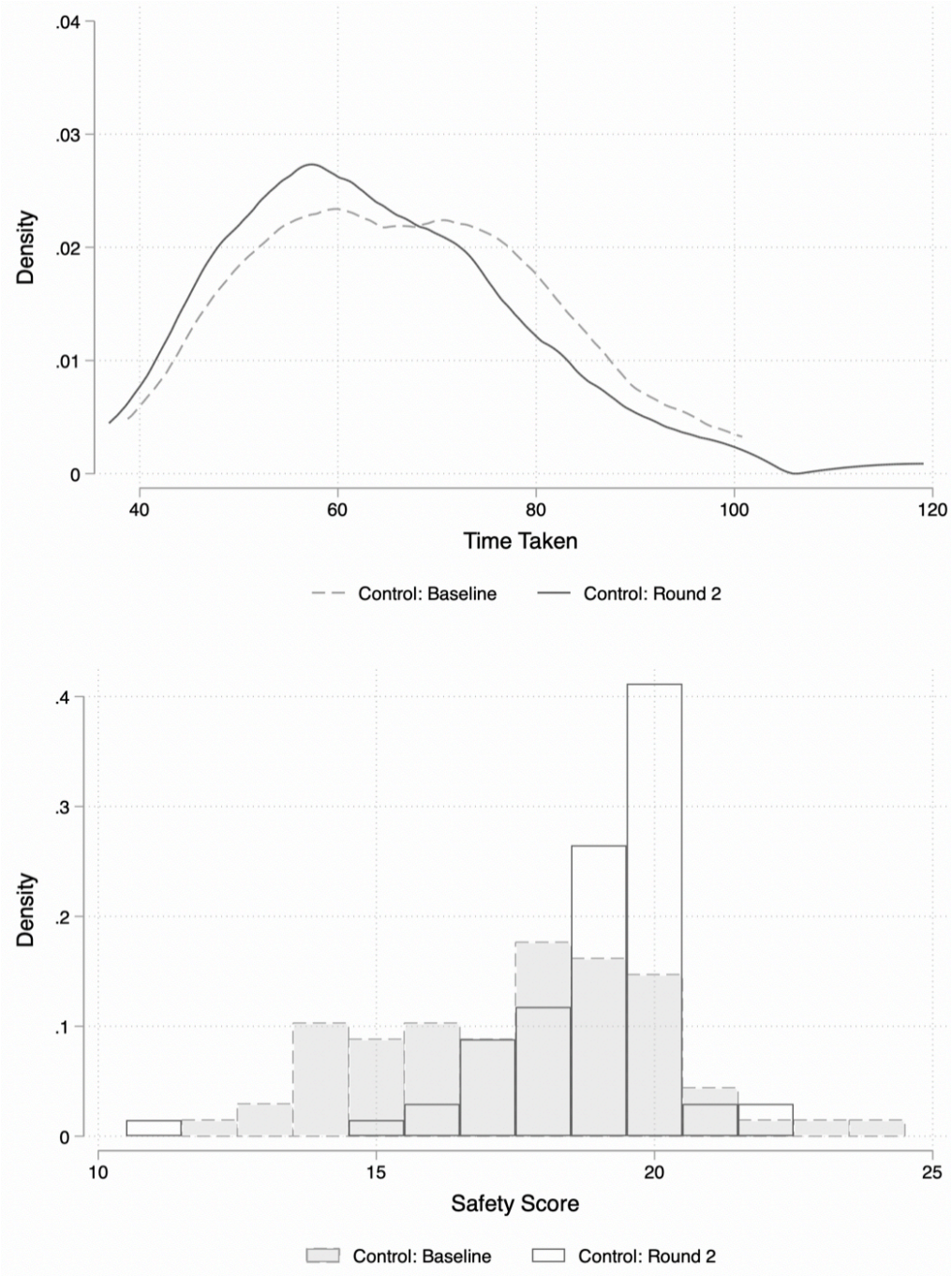
This table shows intention to treat estimates for each treatment relative to the *Control* group using seemingly unrelated regressions. Observations are at the linemen pair level.

Appendix Table 5: Likelihood of executing the correct sequence of steps as highlighted in video

	(1)	(2)
	Correct Sequence	Correct Sequence
Multiple Goals	0.02	0.03
	(0.05)	(0.05)
Best Practice	0.01	-0.00
	(0.06)	(0.05)
Best Practice + Multiple Goals	0.10	0.07
	(0.07)	(0.07)
Strata FE	Yes	Yes
Step FE	No	Yes
Instructor FE	No	Yes
Controls	Yes	Yes
Observations	270	270
Mean (control)	*0.84*	*0.84*
SD (control)	*0.37*	*0.37*

This table shows intention to treat estimates for each treatment relative to the *Control* group on whether linemen executed the step in the correct sequence, which can operate as a version of a manipulation check. effects. Observations are at the linemen pair level. The dependent variable for each regression is a binary variable of whether the lineman executed the correct sequence of steps.

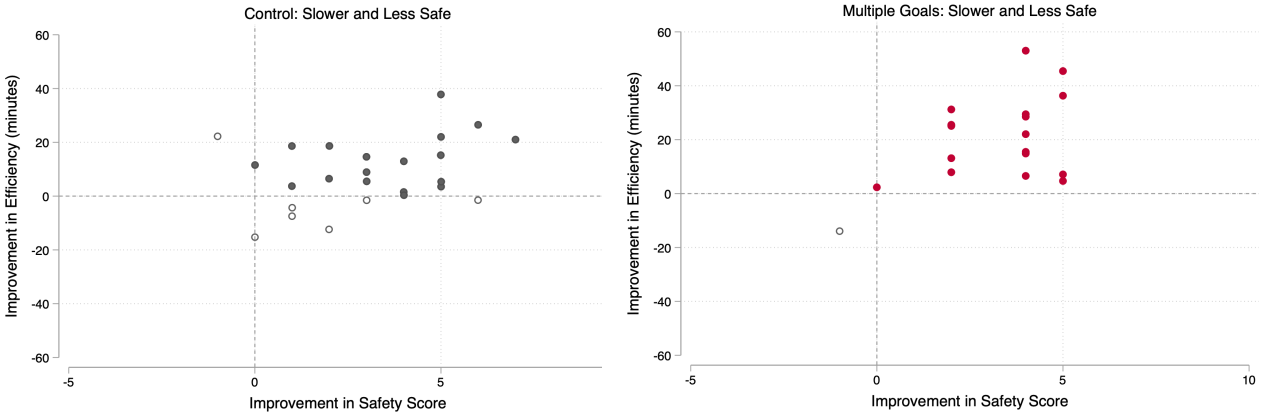
Appendix Figure 1: Changes in efficiency and safety from baseline for *Control*



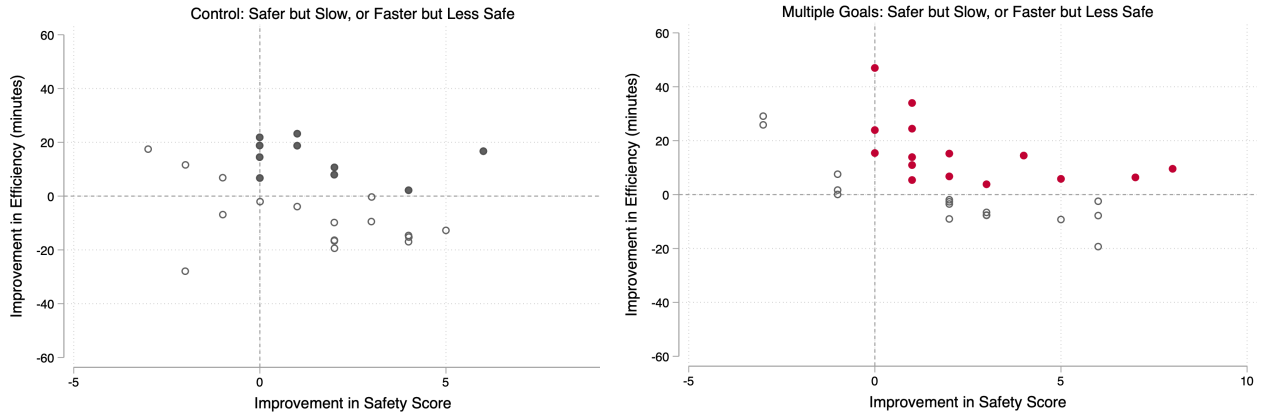
The top figure (a) shows the distribution of time taken for the grounding procedure across linemen pairs. Baseline time = 66.4 (sd: 14.5); Mean Round 2 time = 63.4 (14.9). Two-sample Kolmogorov-Smirnov Test for time taken in (a): p-value= 0.454. The bottom figure (b) shows the distribution of safety scores across linemen pairs. Baseline Safety = 17.6 (sd: 2.5); Round 2 Safety = 19 (sd: 1.7). Two-sample Kolmogorov-Smirnov Test for safety in(b): p-value = 0.001.

Appendix Figure 2: Improvements in efficiency and safety by baseline quadrant

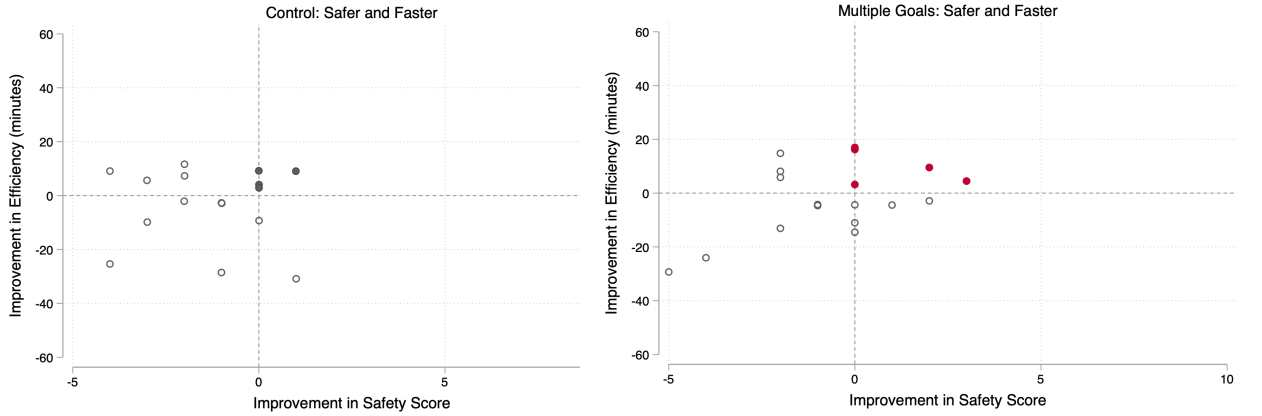
(a) Slower and Less Safe



(b) Safer but Slow, or Faster but Less Safe

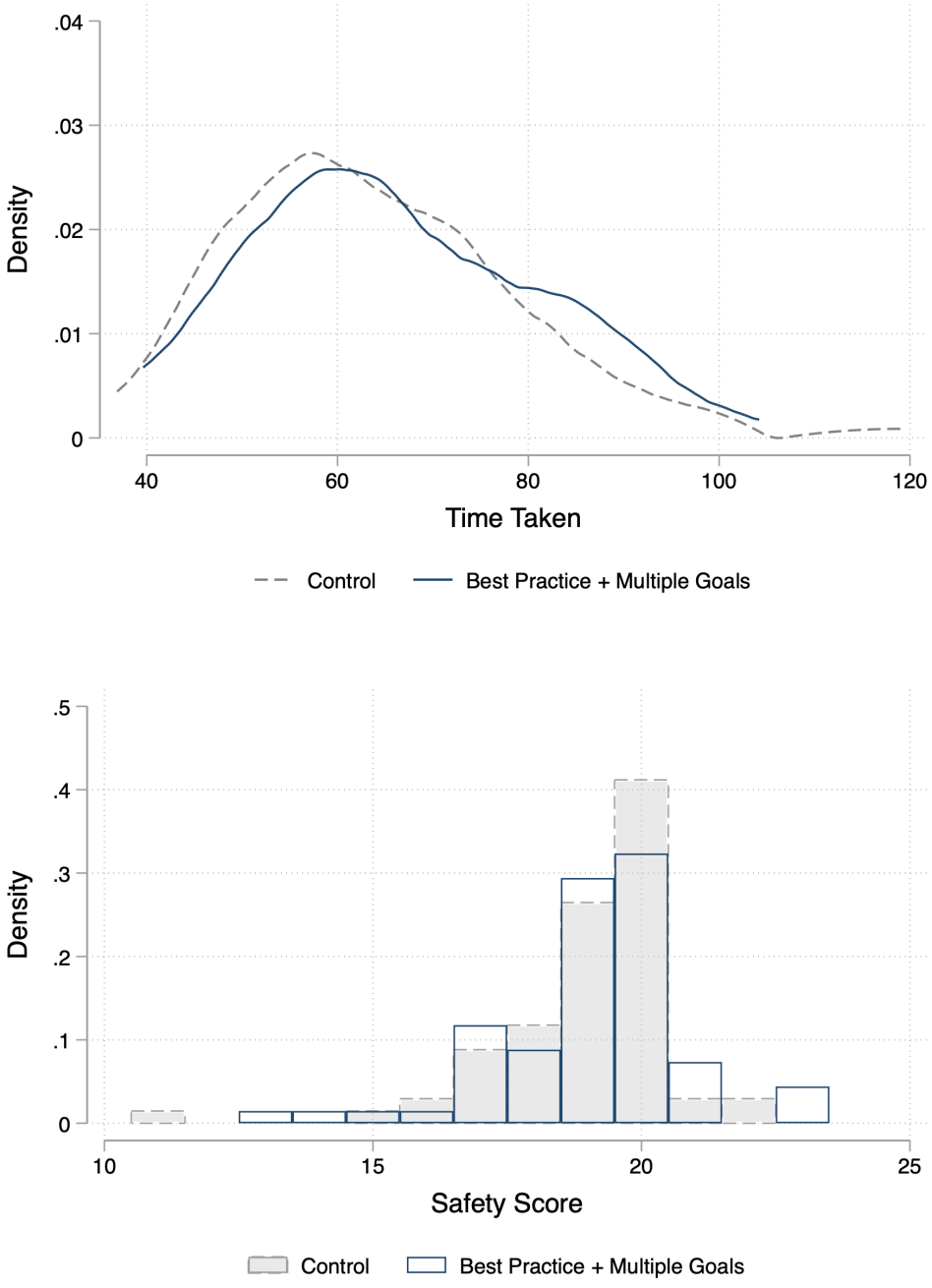


(c) Safer and Faster



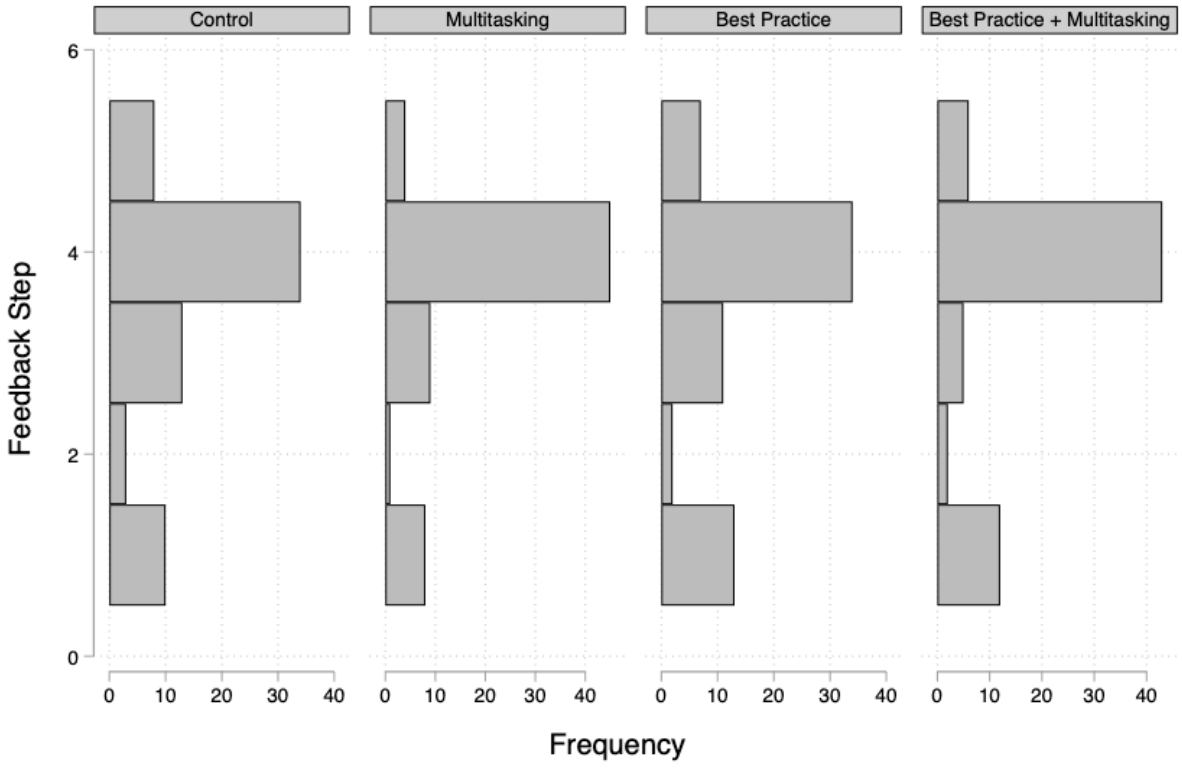
These figures show how linemen assigned to *Control* and *Multiple Goals* improve in efficiency and safety, segmented by their baseline performance compared to the mean, as shown in quadrants in Appendix Figure 1(c): linemen who were slower and less safe at baseline, linemen who were safer but slow, or faster but less safe, and linemen who were both safer and faster.

Appendix Figure 3: Average treatment effects of *Best Practice + Multiple Goals*



Notes: These figures plot the distribution of linemen pairs' times and safety scores in *Best Practice + Multiple Goals* compared to those in the *Control* group in Round 2. Two-sample Kolmogorov-Smirnov tests for equality of distribution: Time: 0.73; Safety: 1.0.

Appendix Figure 4: Distribution of Feedback Steps across Experimental Conditions



Appendix A: Experimental details

This appendix provides screenshots of the videos used as treatments, as well as the detailed script used for all videos.

Appendix Figure A.1: Base *Control* and *Multiple Goals* Video

Appendix Figure A.2 Examples from Best Practice video extension for *Best Practice* Conditions


Revisión previa
del equipo


Paso 3:
Instalación de ménsula y
conexiones al neutro
Conexión al Neutro

Appendix Table A.1 Scripts across videos

The following table provides the detailed script used for videos across the *Control* and *Multiple Goals* conditions. The base *Control* script varied depending on the worst step performed by the pair at baseline and their safety score for that step. The *Multiple Goals* treatment additionally layered on the "Efficiency addition" for that step on top of the *Control* video.

Step	Score	Script (translated from original language)
1	0	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety. Before starting the task, you should consider the evaluation of risks associated with the task and its environment, the assignment of responsibilities for risk control and mitigation, definition of plans for emergency care, as well as the safety chat. The results of this safety analysis should be effectively communicated to the whole team. A good Job Safety Analysis (JSA) should contain: a) Sequential tasks to be completed and those responsible for each task. b) Medium and high-risk hazards associated with obstacle work. c) Clear actions for hazard control, according to the identified hazards. d) Emergency plan to implement in the event of an incident, for the job or day in question. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.[1]
	1	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety. The Job Safety Analysis (JSA) and the safety chat should include the development of a risk or hazard analysis for each job performed, especially for jobs with medium or high-risk hazards. The risk assessment is expected to consider all potential sources of danger, including, but not restricting to: job activities, job equipment, workplace conditions, human factors, and / or environmental and / or climatic conditions related to the job to be done. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.

[1] This phrase is removed when combined with the efficiency script for the Multiple Goals treatment, to end the video with the same statement while avoiding redundancies.

	2	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety. When a change in the work plan introducing significant risks occurs, the task should be stopped to review the hazards according to the Risk Control Hierarchy, indicating the controls and changes in the JSA and then continuing with the work in progress. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	3	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety. Complete all the fields of the [*company protocol*] document. Sign the JSA after having the safety chat, acknowledging the risks associated with the job. Suspend all activities that present unidentified hazards in the JSA by exercising stop-work authority, and report to the job manager. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	4	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety. Fill out the JSA with legible handwriting, avoid erasures or amendments in the document and clearly express the risks associated with the work to be done. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	5	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 1, Risk Assessment and JSA Elaboration, and the importance of safety.

		The JSA is considered dynamic since every time there is a change in the planned work plan, the risk assessment process must be carried out again and disclosed to the entire team that will carry out the tasks. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	Efficiency addition	I would also like to talk about the importance of efficiency. Do not forget that while risk assessment and the assignment of controls are important for your safety, you must also take into account that the JSA must be agile and therefore executed in the shortest possible time, as grounding involves considerable time on task. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
2	0	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. You must verify and immediately dispose of the equipment and tools to be used in the task. You must verify that all parts (Bridges, Staples, etc.) of the PAT Set are complete, in good condition, that the connection terminals are properly tightened and that the Bridges have the current laboratory tests. You must perform Noisy Tester testing at floor level as part of equipment inspection. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	1	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. The combination of safe working practices following standards and the proper use of PPE, EPC and tools are the main factors that can help avoid incidents. Do not forget that the timely detection of out-of-standard conditions and their control will lead to safe work practices. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	2	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement.

		I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. You must review the existence and good condition of your PPE, EPC and tools to use before the start of your workday. The use and care of the PPE, EPC and tools provided by [*the company*] is mandatory. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	3	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. Each working group is obliged to review the status of the PPE, EPC and tools necessary for their work on a daily basis using [*company document protocol*]. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	4	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. You must carry out a more detailed inspection of all the equipment to be used, taking into account its correct handling, test dates and risk points in the tasks. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	5	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 2, Execution of previous inspection tasks, and the importance of safety. Continue to improve your safety performance and set a good example to others who are performing this task. Contribute to the safety culture and work on transferring the best practices associated with task with coworkers. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.

	Efficiency addition	I would also like to talk about the importance of efficiency. The inspection tasks should begin before leaving the campus with the use and execution of daily initial planning, therefore the inspection of the PAT team in the field must be carried out in the shortest possible time without undermining being rigorous and precise. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
3	0	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety. You must comply with the first 3 golden rules before installing the groundings: effective cut, blocking and signaling, as well as verification of lack of voltage, respectively (note that lack of voltage can be perfectly checked in this step) Do not forget to select the installation point of the PAT electrode within an approximate radius between 1.5 and 3 meters away from the base of the pole, taking into account that its installation depth should be approximately 1.50 meters and its perimeter around the electrode must be indicated, even when it is within the previously marked work area. Class zero gloves should be used to brush the neutral when making contact. The connection to the neutral of the 2-meter bridge must always be made with the universal pole, making sure to make the connection in the brushed conductor section. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	1	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety. Always respect the safety distances in relation to the approach to the secondary. The connection to the neutral of the 2-meter bridge must always be made with the universal pole, making sure to make the connection in the brushed conductor section. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	2	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety.

		Perform another inspection at height to verify the condition of the lines, structures and equipment. In the case that you identify hazards and conditions not included in the previous evaluation, communicate this to the work team, adopt the respective control measures, and modify the JSA. The connection to the neutral of the 2-meter bridge must always be made with the universal pole, making sure to make the connection in the brushed conductor section. Do not forget to respect the safety distances in relation to the approach to the secondary. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	3	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety. Verify the proper installation of the bracket, making sure that when handling the bridges, they do not make contact with the body. Verify the correct fastening of the clip in the bracket. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	4	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety. A pulley should be installed to lift loads to facilitate their handling and reduce worker fatigue. (Select a suitable point, a height higher than the lineman's position so that it does not hinder work and reduces physical effort when holding materials.) Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	5	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 3, Bracket installation and neutral connections, and the importance of safety. Continue to improve your safety performance and set a good example to others who are performing this task. Contribute to the safety culture and work on transferring the best practices associated with task with coworkers. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.

	Efficiency addition	I would also like to talk about the importance of efficiency. It is necessary to install, brush and connect to the neutral in the shortest possible time, so you should consider installing the messenger rope with the pulley to minimize the time for bracket installation and neutral connections. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
4	0	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety. NEVER run the short circuit or hiss test, or skip the no voltage check step, before starting this step. For a good connection, remove rust and contaminants from the contact point of the phase conductors by brushing them. Attach the 2-meter bridge clip to the previously-brushed contact point of the phase conductor Ensure that the clamp jaw is installed frontally (and visible) to the Lineman position. Avoid contact of the phase bridges with the body at all times. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	1	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety. Always hoist the 6-meter bridge that goes from the bracket to the phases using a messenger rope Before hoisting said bridge, it is recommended to loosen the stud of both clamps, so that the jaw fits easily in the bracket and conductor respectively Avoid contact of the phase bridges with the body at all times. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	2	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety.

		The Lineman should determine the phase to connect based on the network system and / or conditions found at the time of the task Avoid contact of the phase bridges with the body at all times. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	3	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety. Avoid positioning yourself at the bottom rungs of the ladder when connecting the phases. Always try to take the most ergonomic position to avoid hyperextension injuries and excess fatigue. Avoid contact of the phase bridges with the body at all times. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	4	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety. When starting the connection of the bridges to the phases, always start with the phase that is closest to the lineman's body and verify the correct fastening of the Clip on the Conductor. Avoid contact of the phase bridges with the body at all times. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	5	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 4, bridges installation and phase connections, and the importance of safety. Continue to improve your safety performance and set a good example to others who are performing this task. Contribute to the safety culture and work on transferring the best practices associated with task with coworkers. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	Efficiency addition	I would also like to talk about the importance of efficiency.

		Execute a fast and safe maneuver by ensuring the proper use of the mechanical rod to speed up the installation of the phase bridges without hurting the quality of the connections and the position of the clips. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
5	0	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. Make sure that when handling the bridges, they do not make contact with the body under any circumstances. The staples of the mechanical rod should never be removed by hand when disconnecting the phases. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	1	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. PATs must be removed in the reverse order that the set was installed (the last clip attached should be the first to be removed) Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	2	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. The staples of the mechanical rod should never be removed by hand when disconnecting the phases. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	3	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. Always respect the safety distances in relation to the approach to the secondary.

		Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	4	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. The removal of the groundings must always be carried out in the reverse order of their installation (first the phase disconnection and then the neutral disconnection) Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	5	Hello, my name is (supervisor name), and I am here to provide feedback on your performance during the evaluation of the grounding procedure. The entire procedure involves multiple steps, but I will focus on the specific step where you have the greatest opportunity for improvement. I would like to talk about step 5, Grounding removal, and the importance of safety. Continue to improve your safety performance and set a good example to others who are performing this task. Contribute to the safety culture and work on transferring the best practices associated with task with coworkers. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.
	Efficiency addition	I would also like to talk about the importance of efficiency. Grounding removal remains an important and critical part of efficient task execution, and delays due to improper handling of equipment and lack of task planning before ascending the pole should be avoided. Thank you for viewing this feedback session. Please consider all of this information when performing the second round of evaluations.