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The performance effect of feedback in a context of negative incentives: Evidence from a field experiment

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ABSTRACT

We use a field experiment conducted in a North American hospital to study the performance effect of feedback when negative incentives are present. We analyze feedback effects on e-prescribing rates in a context in which the 181 physicians participating in our experiment have an e-prescribing target and a threat of termination for failing to reach that target. This research context is unique in its use of negative incentives, given that prior research shows that people react differently to positive versus negative incentives, but existing feedback-incentive studies commonly use only positive incentives. Our study finds that the effects of feedback differ according to the *ex ante* level of performance relative to the termination threshold. We find that low performers (those who are *ex ante* below the termination threshold) who receive feedback improve their e-prescribing rates *less* and *later* than low performers in the control group who do not receive direct information about their performance. These differences between the control and treatment groups are also present in a partition of medium performers who underestimate (or overestimate less) their performance, but are not present in either the partition of medium performers who overestimate more, high performers, or performers who exhibit feedback-seeking behavior.

1. Introduction

Feedback is commonly used in organizations to promote desired employee behavior with the expectation that performance, on average, will improve (Kluger and DeNisi, 1996). However, prior research shows that feedback can either have positive, negative, or no effects. This heterogeneity is likely due to the diversity of feedback interventions (Balcazar et al., 1985; Kluger and DeNisi, 1996; Alvero et al., 2001). The variations in the implementation of feedback interventions refer to, for example, the sender (or source), the format of the message, the frequency, whether the feedback refers to an individual or to a group, and whether feedback is provided with or without other reinforcers, such as incentives (Balcazar et al., 1985; Alvero et al., 2001).

The use of feedback in conjunction with incentives is relevant to our study. Prior feedback-incentive studies—regardless of variations in incentive schemes and types of feedback given—commonly use positive incentives, i.e., a reward is given for good performance (Balcazar et al., 1985; Alvero et al., 2001). However, employment contracts have

explicit (or implicit) evaluations and poor performance can lead to negative consequences (Pryor, 1984; Rousseau, 1989). In this case, performance feedback is important because it conveys information regarding that evaluation. Our setting is unique in that it provides a situation in which there is a clear formal performance evaluation that can potentially lead to contract termination. Aside from the threat of contract termination, poor performance can lead to other negative incentives, such as personal discomfiture, reputation consequences, and promotion concerns.

Positive and negative incentives are the “carrots” and “sticks” of the workplace (Pryor, 1984; Dickinson 2001) and daily life (Ayres 2010). The distinction between positive and negative incentives is important as prior research demonstrates that people react differently to gains and losses (Kahneman and Tversky, 1979; Tversky and Kahneman, 1991). This difference is also present in contracts that include incentives framed as bonuses or penalties (e.g., Luft, 1994; Hannan et al., 2005; Church et al., 2008; Frederickson and Waller, 2005; Christ et al., 2012; Newman and Tafkov, 2014). Even though the majority of prior research

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is conducted in labs, recent studies provide evidence from the field (e.g., Hossain and List, 2012; Fryer et al., 2012; Chung and Narayandas, 2017; List and Samek, 2015; Armantier and Boly, 2015; Hong et al., 2015; Jayaraman et al., 2014) but none of them include any consideration for the impact of feedback on performance.

Our field experiment builds on this literature by showing the effect of feedback in a context of negative incentives, specifically a threat of contract termination that occurs if performance scores fall below a minimum threshold. Additionally, we analyze the differential effect of feedback when employees exhibit feedback-seeking behavior. Even though most research assumes that employees are passive in the process of obtaining information about their performance, a different stream of research suggests that employees may actively look for feedback (Ashford and Cummings, 1983) and this behavior may lead to differences in performance (Renn and Fedor, 2001).

We develop our study in a unique setting—the implementation of electronic prescribing (e-prescribing) in a North American hospital—characterized by formal evaluation periods and an established performance threshold with a threat of contract termination for falling below that threshold. Specifically, physicians are subject to a non-continuous evaluation system through which in each evaluation their performance is assessed in the first three months of a six-month time period. Physicians cannot be below the threshold in three consecutive evaluations if they want to avoid termination. Aside from the termination threat, physicians would also be subject to other negative consequences such as personal discomfiture as they would have to meet with a superior to review their performance and engage in specific training in order to meet the target. In a competitive environment, such as our setting, scoring below the threshold would also have reputational consequences and could lead to promotion concerns. E-prescribing may seem a less important task in the work of a physician, but an increasing effort is being made world-wide to eradicate the instances of prescription errors and to improve patient safety, the quality of medical care, and coordination among health practitioners (Radley et al., 2013). Electronic medical records, and particularly e-prescribing, are key factors in this effort. E-prescribing also enables cost control and fraud detection, with subsequent savings in healthcare costs (Pangalos et al., 2014). Therefore, the adoption of electronic medical records and e-prescribing as a core measure of pay-for-performance in hospital settings is not unwarranted (Rowe, 2006). In our setting, we implement a field experiment with 181 physicians who are assigned to two experimental groups. Physicians in the treatment group receive performance feedback about their individual and their practice's e-prescribing rate. Additionally, these physicians can access a web page that provides a graphical display of their historical performance, as well as that of their practice. The log of accesses to this web page by individual physicians is our proxy for feedback-seeking behavior. Conversely, physicians in the control group do not receive any direct information about their performance.

Our results show that the effect of feedback varies according to the *ex ante* level of performance relative to the termination threshold. Low performers (those who are *ex ante* below the termination threshold) in the treatment group improve their e-prescribing rates less than low performers in the control group who receive no explicit information about their distance from the goal. Low performers in the treatment group, in comparison to those in the control group, increase their performance *later* once the feedback is removed in the third period of the formal evaluation, the outcome of which could result in termination. These differences between treatment and control groups are also present in the partition of medium performers who underestimate (or overestimate less) their performance but do not apply to either the partition of medium performers who overestimate more, high performers, or performers who exhibit feedback-seeking behavior.

Our study contributes to several streams of literature. First, we contribute to an emerging stream of research that analyzes the interplay between feedback and incentives at the individual level (e.g., Sprinkle,

2000; Hannan et al., 2008; Casas-Arce and Martínez-Jerez, 2009; Tafkov, 2013; Newman and Tafkov, 2014; Lourenço, 2016; Casas-Arce et al., 2017). This stream of research shows that the effect of the type of feedback (incentive) on performance is dependent on the incentive (feedback) used. We add to this research by showing the effect of feedback in the field when negative incentives are in place. Second, we contribute to the literature on contracts by using a unique setting that allows us to show the behavioral effects of feedback when a clear threat of termination (a negative incentive) is present (Baker et al., 1988). Even though the “threat of termination” is ever-present in contracts, researchers rarely have the opportunity to formally test its effects on agent behavior. Third, we contribute to the accounting literature with regard to the design of reporting and compensation systems by showing that providing information is not always beneficial. When negative incentives are in place, such as a threat of termination, decision makers who design reporting systems might actually want to omit rather than reveal performance information, particularly to those employees who are more at risk. Conversely, if performance information is readily available for employees, then decision makers who design incentive systems might want to avoid using negative incentives. Fourth, we also contribute to the healthcare literature by showing that the effect of disclosing information to employees does not always, on average, lead to positive effects on health-related outcome measures of performance as prior research suggests (e.g., Eldenburg, 1994; Evans et al., 1997; Jamtvedt et al., 2006; Kolstad, 2013; Ramanarayanan and Snyder, 2012). Our study, unlike prior studies, employs a context of formal negative incentives at the individual level. It is this difference that most likely explains our unique results.

The paper proceeds as follows. The following section presents the literature review related to our study and our hypotheses. Section 3 describes the method. Section 4 presents the data and reports the results. Finally, Section 5 concludes.

2. Literature review

2.1. Feedback and performance

Feedback is a heterogeneous construct (Alvero et al., 2001), but a common element is that it refers to information provided about past performance. However, there is a variety of ways in which that information is provided, with regard to the sender (source), format of the message, frequency of the feedback, whether the feedback refers to an individual or to a group, and whether feedback is provided with or without other reinforcers, such as incentives (Balcazar et al., 1985; Alvero et al., 2001). Therefore, the disparity of results reported regarding feedback interventions is not surprising (Balcazar et al., 1985; Kluger and DeNisi, 1996; Alvero et al., 2001).

Several organizational behavioral theories describe mechanisms through which feedback affects performance, namely goal-setting theory (Locke and Latham, 1990), social cognitive theory (Bandura, 1986), and control theory (Carver and Scheier, 1982). These theories postulate that feedback provides an opportunity for individuals to compare their behavior to predefined targets (goals) and to determine whether their actions need to be adjusted accordingly. Specifically, goal-setting theory posits that feedback can lead to greater efforts by the performers by signaling to those performers that they are below goal, or lead to a similar or lower effort if the goal has been met or surpassed (Latham and Locke, 1991). Social cognitive theory suggests that feedback provides information to help self-regulated agents reduce discrepancies between goals and performance in a proactive way. Instead of reacting to differences between goals and performance, people set consecutively higher personal goals that need to be met and thus lead to performance improvements (Bandura and Locke, 2003). However, positive feedback may not necessarily improve performance if it signals that current performance is already satisfactory (Matsui et al., 1983) and thus higher personal goals are not established (Bandura and

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