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Seek and Ye Might Not Find: The Effects of Contract Framing on Knowledge Sharing and Knowledge Seeking

Qui cherche ne trouve pas toujours : les effets liés à la formulation des contrats sur le partage et la recherche de renseignements

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ABSTRACT

We conduct two experiments to examine whether and how the framing (bonus vs. penalty) of a target-based incentive contract affects knowledge sharing and knowledge seeking. In the first experiment, we predict and find that penalty-framed contracts increase employees' stress due to the fear of potential loss, which in turn reduces their willingness to share knowledge. Additionally, consistent with loss aversion, employees under penalty-framed contracts are more likely to seek knowledge than those under bonus-framed contracts. The second experiment corroborates our theoretical arguments by demonstrating the crucial role of stress in reducing knowledge-sharing behavior. The results show that, when stress is alleviated through an informal control mechanism, penalty-framed contracts no longer reduce knowledge sharing. The implications of our findings for research and practice are discussed.

RÉSUMÉ

Les auteurs conduisent deux expériences visant à examiner dans quelle mesure le processus de formulation (axé sur la prime ou la pénalité) d'un contrat d'intéressement lié à l'atteinte des objectifs influe sur le partage et la recherche de renseignements. Dans la première expérience, ils formulent et confirment l'hypothèse selon laquelle les contrats portant sur des pénalités accroissent le niveau de stress des employés en raison de la crainte d'une perte potentielle, ce qui freine leur propension à partager des renseignements. Par ailleurs, conformément au principe d'aversion aux pertes, les employés liés à des contrats portant sur des pénalités sont plus enclins à

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chercher des renseignements que ceux liés à des contrats portant sur des primes. La deuxième expérience vient appuyer leurs hypothèses théoriques en démontrant le rôle crucial du stress dans la propension des employés à partager des renseignements. Les résultats montrent que, lorsque le stress est atténué grâce à un mécanisme de contrôle informel, les contrats portant sur des pénalités ne freinent plus la propension à partager des renseignements. Les implications de ces résultats pour la recherche et la pratique sont ensuite discutées.

Power comes not from knowledge kept but from knowledge shared.

Bill Gates

The only people who achieve much are those who want knowledge so badly that they seek it while the conditions are still unfavorable.

C. S. Lewis

1 | Introduction

Knowledge is the foundation of a firm's competitive advantage and a key driver of organizational success (Grant 1996; Boisot 1998). Since knowledge often resides at the individual level, knowledge transfer—employees seeking and sharing mutually relevant information, ideas, suggestions, and expertise—is critical for improving decision quality and productivity (Bartol and Srivastava 2002; Haas and Hansen 2007). However, effective knowledge transfer can be difficult to achieve due to the costs associated with both knowledge sharing (e.g., time and effort) and knowledge seeking (e.g., fear of appearing incompetent) (Bamberger 2009; Wang and Noe 2010; Grabner and Haesebrouck 2022). Notably, the unobservable nature of private knowledge makes it hard for firms to directly incentivize knowledge sharing (Haesebrouck et al. 2021). Therefore, it is important to understand how firms' control system design choices, beyond incentives, affect knowledge transfer among employees. In this paper, we investigate whether and how the framing of incentive contracts (bonus vs. penalty) used to motivate employee performance on a focal task affects their motivation to share and seek task-related knowledge.

Contract framing is an important consideration in the design of formal control systems, particularly when incentives are based on target achievement (Luft 1994). Bonus-framed contracts increase monetary rewards when performance targets are met (i.e., “positive” incentives), whereas penalty-framed contracts reduce monetary payouts when targets are not met (i.e., “negative” incentives). Bonus-framed contracts are often perceived as fairer, are preferred by employees, and are commonly used in practice (Luft 1994; Hannan et al. 2005). Penalty-framed contracts are found to induce greater effort and increase productivity, and are sometimes adopted to deter employee misconduct (Luft 1994; Hannan et al. 2005; Church et al. 2008; Hossain and List 2012; Hong et al. 2015). While prior literature primarily focused on the effect of contract framing on effort and performance, our study examines its influences on knowledge sharing and seeking. In addition, our study provides insight into how firms can redress these influences through informal control mechanisms. We conduct two experiments to investigate these issues.

To the extent that knowledge sharing is a prerequisite for knowledge transfer, we begin our study with a focus on how contract framing affects employees' motivation to share knowledge. Prior research shows that incentive and performance evaluation systems, while having positive effects on effort and performance, can increase stress (Ariely et al. 2009; Cardinaels and Feichter 2021). In our setting, employees under bonus-framed contracts have the opportunity to gain additional compensation if they meet a performance target, whereas those under penalty-framed contracts face a potential loss of compensation if they fail to meet the target. Research suggests that individuals derive greater disutility from a loss compared with the utility from an economically equivalent gain, referred to as loss aversion (Kahneman and Tversky 1979). Continuing this line of reasoning, we contend that employees may experience greater stress under penalty-framed contracts. In turn, drawing on conservation of resource theory, we expect that heightened stress reduces employees' willingness to share knowledge with their coworkers.

Specifically, conservation of resources theory suggests that individuals under stress will strive to protect their own resources (Hobfoll 1988, 1989). These resources can encompass anything individuals value, including objects, conditions, personal characteristics, and energies, such as time and effort, personal identity, and competitive advantages (Hobfoll 1988, 1989; Halbesleben et al. 2014). In our setting, we theorize that stress induced by penalty-framed contracts

may lead employees to prioritize conserving resources, including private knowledge ownership and the time and effort required for knowledge sharing. Thus, we hypothesize that a penalty-framed contract will result in less *knowledge sharing* as compared with a bonus-framed contract.

Next, we develop a prediction regarding how contract framing affects employees' motivation to seek knowledge. When deciding whether to seek knowledge, employees will weigh the costs—such as additional time and effort and concerns about self-image (Lee 1997, 2002; Bamberger 2009)—against its benefits, including problem-solving and improved work efficiency (Bamberger 2009; Lim et al. 2020). According to loss aversion, individuals generally have a stronger motivation to avoid a penalty than to obtain an equivalent bonus. Therefore, under a penalty-framed contract, the opportunity to prevent missing a target through knowledge seeking may become more salient than the opportunity to meet a target under a bonus-framed contract. Thus, we hypothesize that, compared with bonus-framed contracts, penalty-framed contracts will result in more *knowledge seeking*.

Our first experiment (“Experiment One”), consisting of two parts, is designed to test these two predictions. Part 1 examines the effect of contract framing on *knowledge sharing*. Participants assume the role of a corporate manager and perform a product-design task for multiple periods. We manipulate, between participants, the framing of the incentive contract: in the Bonus-Framed condition, participants are paid a base salary of 50 lira (an experimental currency) and receive another 50 lira if their performance meets a predetermined target. In the Penalty-Framed condition, participants are paid a base salary of 100 lira, and 50 lira is deducted from their base salary if their performance does not meet the target. After completing the task, participants are asked if they would like to share their task knowledge, at a cost of 5 lira, with a coworker in a future session. Several days after Part 1, we conduct Part 2 to examine the effect of contract framing on *knowledge seeking*. Participants perform the same product-design task, and we manipulate contract framing the same way as in Part 1. Before starting the task, participants are given the opportunity to request task-related knowledge provided by others who completed the same task in a previous session, at a cost of 5 lira.

The results of Experiment One show that participants under penalty-framed contracts are less likely to *share knowledge* than those under bonus-framed contracts. Mediation analysis further supports our theory, indicating that stress (measured in the post-experiment questionnaire) significantly mediates the negative effect of penalty-framed contracts on participants' willingness to share knowledge. Also consistent with our prediction, we find that participants are more likely to *seek knowledge* under penalty-framed contracts than under bonus-framed contracts. The results of two supplemental experiments show that our results are robust in settings where the cost of knowledge sharing is nonmonetary, such as requiring additional effort or reducing one's own probability of earning additional compensation.

In light of the results of Experiment One, we design a second experiment (“Experiment Two”) with two objectives. First, we examine how the negative effect of penalty-framed contracts on knowledge sharing can be mitigated. Prior accounting literature suggests that value statements, which communicate organizational norms and desired employee behaviors and attitudes, can serve as an informal control (Kachelmeier et al. 2016; Akinyele et al. 2020, 2022). We propose that firms can leverage value statements to promote a constructive attitude toward potential workplace failures (e.g., missing performance targets), thereby reducing employees' stress associated with penalty-framed contracts. Second, we use Experiment Two to further test the role of stress through a moderation-of-process approach, as suggested by Asay et al. (2022). Specifically, we examine whether the negative effect of penalty frames on knowledge sharing is mitigated when stress is no longer the dominant factor.

The task setting, design, and procedures of Experiment Two are similar to those in Experiment One. The key difference is that, in Part 1 (knowledge sharing), participants read a corporate value statement emphasizing a constructive attitude toward workplace failures after learning about the contract types but before starting the task. We find that employees' stress levels (measured in the post-experiment questionnaire) no longer significantly differ between bonus-framed and penalty-framed contracts, nor is there any significant difference in the likelihood of knowledge sharing across these two contract types. These findings provide additional evidence in support of our theoretical argument regarding the role of stress in the effect of penalty-framed contracts on knowledge sharing. These results also suggest that informal control mechanisms (e.g., corporate value statements) can mitigate the negative side effects of formal control mechanisms, such as penalty-framed contracts.

Our paper makes several theoretical and practical contributions. First, our study adds to the knowledge management literature by showing that contract framing—an important and common design choice of formal control systems focused on employees' focal tasks and targets—can affect knowledge sharing and knowledge seeking. By studying the

behavior of both knowledge providers and seekers within the same task setting, our study offers a more comprehensive perspective on the dynamics of knowledge transfer within organizations than examining providers or seekers in isolation, shedding light on the broader impact of contract framing on employee behavior beyond the focal task.

Second, our paper offers a potential explanation for why penalty-framed contracts rarely replace bonus-framed contracts in practice despite their strong motivational effect on employee effort. Prior literature suggests that penalty contracts could harm trust (Christ et al. 2012) or lead to reduced motivation when there is payoff ambiguity (Burke et al. 2023). Adding to this stream of literature, our study shows that penalty-framed contracts can also lead to heightened stress, which in turn reduces employees' willingness to share knowledge. By documenting another downside of using penalty-framed contracts, our findings help explain the persistent preference for bonus-framed contracts in practice (Gonzalez et al. 2020). In addition, we provide initial evidence suggesting that the negative effects of penalty-framed contracts on knowledge sharing can possibly be mitigated with an informal control mechanism.

Finally, our results have significant practical implications. Firms commonly use various performance-based incentive mechanisms that may trigger loss aversion. For example, forced rating systems (i.e., rank-and-yank) are found to increase employee stress (Cardinaels and Feichter 2021). Similar to the penalty-framed contract examined in our study, these mechanisms may likewise have adverse effects on knowledge transfer. We further propose that firms may leverage informal controls, such as value statements that promote a constructive workplace attitude, to mitigate these adverse effects. While other methods for alleviating stress may exist, emphasizing corporate value statements can be a cost-effective approach to mitigate stress and improve knowledge sharing. Understanding these effects can help firms develop a more holistic approach to designing management control systems to achieve organizational goals.

2 | Theory and Hypotheses

2.1 | Knowledge Transfer in Organizations

Knowledge, which encompasses information, ideas, and expertise necessary for individuals to perform tasks, is widely recognized as a critical resource and the foundation of a firm's competitive advantage (Bartol and Srivastava 2002). Both researchers and practitioners have increasingly explored ways to facilitate knowledge flows within organizations (Haesebrouck et al. 2018, 2021; Bol and Leiby 2022; Tafov et al. 2022). As elaborated below, effective knowledge transfer relies not only on employees' willingness to share knowledge but also on their motivation to seek it (Grant 1996; Argote and Ingram 2000; Watson and Hewett 2006).

2.1.1 | Knowledge Sharing

Knowledge can be shared through various mechanisms, depending on the organizational context (Haas and Hansen 2007). In some settings, employees' tasks are highly interdependent, and knowledge sharing is essential for enhancing task efficiency and improving outcomes (Srivastava et al. 2006).¹ In these environments, employees may share knowledge during formal or informal interactions, such as mentoring junior colleagues or responding to coworkers' requests (Hansen 1999; Bartol and Srivastava 2002). Direct interactions (e.g., when coworkers seek help) can increase the likelihood of knowledge sharing, as knowledge holders may feel a psychological obligation to respond (Flynn and Lake 2008). Moreover, knowledge sharing in these contexts not only benefits the recipients but may also help the contributors build mutual relationships and enhance personal status (Bol and Leiby 2022).

In other settings, task interdependence among employees is relatively low. For example, customer-facing roles (e.g., customer-service and sales representatives) typically involve a high degree of discretion, as employees often interact individually with customers (Batt 1999; Jasmand et al. 2012). Similarly, "knowledge-intensive" roles (e.g., software engineers; business consultants and analysts) tend to be characterized by substantial autonomy and independence (Nurmi 1998; Donnelly 2006). In recent years, technological advances have facilitated a shift toward remote work (Dosi et al. 2017; Alblass 2022; Adamczyk 2023; Haan 2023). Remote environments are particularly suitable for low-interdependence tasks—employees in these tasks are less likely to encounter communication and coordination challenges "since they are able to work more independently" (Golden and Veiga 2005, 60; Golden and Gajendran 2019).

Nevertheless, knowledge sharing is important for enabling organizations to develop collective domain-specific expertise and, thereby, sustain their competitive advantage (Nunes et al. 2006; Cavaliere et al. 2015).

In these contexts, knowledge sharing often occurs through less interactive channels. For example, employees may voluntarily contribute to knowledge management repositories, such as internal forums and databases, or create process documentation (Kankanhalli et al. 2005a; Haas and Hansen 2007; Curtis and Taylor 2018). As a result, knowledge sharing may not provide contributors with the same relational benefits as in interaction-intensive organizational contexts (e.g., Haas and Cummings 2015; Mickeler et al. 2023). In this paper, we focus on knowledge sharing within low-interdependence organizational settings where direct personal interactions are relatively limited.

In these settings, facilitating knowledge sharing can be challenging, as it is mostly an extra-role activity that demands time and effort, competing with the resources employees could use to pursue personal goals (Koopman et al. 2016). Additionally, knowledge is often viewed as a source of power, and sharing it can be perceived as a loss of power (French and Raven 1959). The growing use of competition-based management control systems may heighten employees' concerns about protecting their competitive advantages, further discouraging knowledge sharing (Chennamaneni et al. 2012; Berger et al. 2019).

2.1.2 | Knowledge Seeking

While knowledge sharing is essential for knowledge transfer, employees' motivation to seek knowledge is also critical to its success. Without employees seeking knowledge, the value of knowledge sharing cannot be realized (Kankanhalli et al. 2005b; Bock et al. 2006; He et al. 2009). Employees may seek knowledge through various means, such as accessing knowledge management repositories, observing colleagues, participating in training sessions, or directly inquiring (Kankanhalli et al. 2005b; Mickeler et al. 2023; Sherf et al. 2024). However, several factors can influence their motivation to seek knowledge: identifying and exploring relevant sources require time and effort, and effectively decoding collected information can pose additional challenges (Veeravalli et al. 2019; Lim et al. 2020; Fasbender and Gerpott 2021). Moreover, feelings of incompetence or self-image concerns may discourage employees from directly seeking knowledge from others (Bamberger 2009; Lim et al. 2020).

Given the importance of knowledge transfer for organizational success, prior research has examined how management control systems can affect employees' motivation to share and seek knowledge, as discussed next.

2.2 | Prior Research on Management Controls in Knowledge Sharing and Seeking

A growing body of literature has explored how management control systems influence employees' willingness to share knowledge. Directly tying employees' incentives to knowledge-sharing activities may increase their willingness to share (Kankanhalli et al. 2005a; Wang et al. 2014). However, designing contracts that directly incentivize knowledge sharing can be difficult, particularly since knowledge is often employees' private information (Haesebrouck et al. 2021). Thus, prior research explores how other organizational factors influence knowledge-sharing behavior. For example, incentives based on group output can increase knowledge sharing by aligning employees' interests and strengthening group identity (Hwang et al. 2009; Ortega 2009; Kelly 2010; Haesebrouck et al. 2018). Subjective weighting of performance measures and peer monitoring have also been found to encourage knowledge sharing (M. Cheng and Coyte 2014; Radtke et al. 2023). On the other hand, relative performance evaluations can discourage skilled workers from sharing knowledge, especially more valuable knowledge, because doing so may undermine their competitive advantage (Bowlin et al. 2025).

Other research has examined how management control systems influence knowledge seeking. For example, Burke et al. (2025) find that peer recognition systems stimulate knowledge seeking by creating a help-seeking norm, with the effectiveness contingent on whether seekers and providers work toward the same goals. Additionally, the subjectivity and precision of performance evaluation systems influence employees' advice-seeking strategy (Bauch et al. 2025; Voermans et al. 2024).

Building on this body of literature, our study examines how management control system characteristics that may not seem directly related to knowledge sharing and seeking—specifically, the framing of contracts—can nonetheless impact these behaviors.

2.3 | Background and Prior Literature on Target-Based Contract Framing

Contract framing is an important managerial decision in the design of incentive contracts based on performance targets (Weber and Mayer 2011; Libby and Olczak 2023). Bonus-framed contracts provide employees with monetary rewards when performance targets are met, whereas penalty-framed contracts reduce monetary payouts when targets are not met (Christ et al. 2012). Standard economic theory posits that economically equivalent bonus- and penalty-framed contracts should similarly affect employee behavior. Yet, a large stream of literature demonstrates that employees react to these two contract frames differently. Bonus-framed contracts are often viewed as fairer, help build trust, and connote approval and rewards (Luft 1994; Brink 2011; Christ et al. 2012). On the other hand, penalty-framed contracts motivate greater effort and lead to higher productivity (Hannan et al. 2005; Church et al. 2008). However, despite the potential of penalty-framed contracts to enhance effort and performance, it remains puzzling that bonus-framed contracts are more commonly used in practice (Gonzalez et al. 2020). To better understand this phenomenon, recent research indicates nuances in the effects of contract framing: for instance, the motivational advantage of penalty-framed contracts may diminish when employees can choose their contract or when there is payoff ambiguity (Gonzalez et al. 2020; Burke et al. 2023). Extending this literature, we contend that penalty-framed contracts may have a negative impact on employees' knowledge-sharing behavior relative to bonus-framed contracts.

2.4 | The Effects of Contract Framing on Knowledge Sharing

2.4.1 | Contract Framing–Induced Stress

Penalty-framed contracts induce loss aversion, which has evolved as an adaptive response to self-protection in environments where individuals face potential threats (Li et al. 2012). Neuroscientific evidence further suggests that loss aversion is closely related to affective states (Sokol-Hessner and Rutledge 2019). Because losses loom larger than economically equivalent gains, employees may experience greater stress over potential losses under penalty-framed contracts than they would over missed gains under bonus-framed contracts (Thaler and Johnson 1990; Mannor et al. 2016). In addition, relative to bonus-framed contracts, penalty-framed contracts may be perceived to signal higher expectations for achieving targets to retain the up-front payment (Brooks et al. 2012; Czibor et al. 2022). When meeting these expectations requires significant effort, they can become job stressors (Demerouti et al. 2001; Bakker and Demerouti 2007, 2017). Consequently, employees are likely to experience higher stress under penalty-framed contracts than under bonus-framed contracts (Hobfoll and Lilly 1993; O'Keefe and Jensen 2008).

Prior accounting literature has explored the role of stress in accounting practices. Early studies largely focused on public accounting, finding that job-related stress reduces auditors' job satisfaction and performance while increasing their turnover intentions (Rasch and Harrell 1990; Collins and Killough 1992; Collins 1993; Fogarty et al. 2000; Fisher 2001). Recent research has started to examine stress in management control practices. For example, more frequent performance evaluations reduce employee stress by providing more feedback to guide work behavior (Frimanson et al. 2021), whereas the use of forced rating systems and tighter budget controls increases employee stress (Cardinaels and Feichter 2021; Bedford et al. 2022). We add to this literature by examining how contract framing influences employee stress and, in turn, their knowledge-sharing behavior.

2.4.2 | Hypothesis Development

Drawing on conservation of resources theory, we contend that employees' experience of stress can dampen their willingness to share knowledge. Specifically, conservation of resources theory suggests that individuals generally have the desire to retain and protect their own *perceived* resources, which can include objects, conditions, personal characteristics, and energies that they value (Hobfoll 1988, 1989; Halbesleben et al. 2014). For example, time with family can be viewed as a valuable resource (Halbesleben et al. 2014, 1335). In the context of knowledge sharing, knowledge can also be viewed as valuable resources by employees within an organization. Hence, the concept of resources is broadly defined, encompassing anything that an individual considers valuable, irrespective of whether these resources are economically quantifiable or whether they ultimately lead to a positive outcome. When individuals experience stress, they will strive to conserve existing resources (Hobfoll 1989). In particular, when individuals are confronted with potential resource reduction in one domain, they may compensate for the reduction with resources from another domain, aiming to maintain the total level of resources (Hobfoll 1989, 2001; Hobfoll et al. 1990). Therefore, we argue that an individual experiencing a heightened level of stress may be less willing to forgo personal resources than they otherwise would be.

Thus, when employees face the threat of a loss in compensation from their current task, they may become more inclined to protect other resources and avoid further reduction in personal resources. Given that knowledge sharing requires resources such as time, mental effort, unique ownership of knowledge, and competitive advantages, employees under stress may not be willing to give up these resources. Therefore, if employees experience greater stress under penalty-framed contracts, their willingness to share knowledge with peers may be suppressed.

The above theory and line of reasoning lead us to the following hypothesis:

Hypothesis 1 (H1). *Employees are less likely to share knowledge under penalty-framed contracts than under bonus-framed contracts.*

2.5 | The Effect of Contract Framing on Knowledge Seeking

As previously discussed, loss aversion leads employees to have stronger motivation to avoid potential losses under penalty-framed contracts, compared with the potential of not receiving a gain under bonus-framed contracts. Employees can mitigate potential losses in different ways. Prior research has mainly examined task settings where output is primarily influenced by work effort (e.g., when environmental uncertainty is low), finding that loss aversion may outweigh effort aversion, driving employees to increase effort to boost output (Luft 1994; Hannan et al. 2005; Church et al. 2008). However, in tasks where factors beyond work effort significantly impact output (e.g., when environmental uncertainty is high), increasing effort alone does not necessarily improve performance; instead, seeking task-related knowledge from others can be more effective. As discussed earlier, knowledge seeking involves costs such as time and energy, feelings of incompetence, and threats to self-image (Lee 1997, 2002; Bauch et al. 2025; Boudreau et al. 2017; Lim et al. 2020), yet it remains unclear whether loss aversion overrides these costs.²

Employees are more likely to seek knowledge if the perceived benefits of doing so are higher than the perceived costs (Morrison and Vancouver 2000; Lim et al. 2020). Under penalty-framed contracts, due to loss aversion, employees may place greater value on the benefits of seeking knowledge, relative to its costs (Reychav and Weisberg 2009; Garvin and Margolis 2015). As a result, employees are more likely to seek knowledge under penalty-framed contracts than under bonus-framed contracts.

We formally state this prediction in the following hypothesis:

Hypothesis 2 (H2). *Employees are more likely to seek knowledge under penalty-framed contracts than under bonus-framed contracts.*

3 | Experiment One

3.1 | Overview

Experiment One is designed to test H1 and H2.³ The experiment consists of two parts. In Part 1, we recruit a group of participants as knowledge providers. Several days later, we conduct Part 2, whereby participants are recruited to play the role of knowledge seekers. Parts 1 and 2 are both programmed using oTree (Chen et al. 2016).

3.2 | Part 1: Knowledge Sharing

3.2.1 | Task and Procedure

We use a product-design task to represent a typical employee decision-making setting encountered in practice (de Langhe et al. 2011). In this task, participants design a smartwatch to sell to a new market where the customers' preferences are unknown. Their goal is to design a smartwatch that maximizes profits for the company. Participants perform the task for multiple periods. In each period, the profit of the smartwatch is determined by the following formula:

$$\text{Profit} = 15 \text{ lira} + (a) \text{ Additional Profits/Losses Resulting from Participants' Design Choices} \\ + (b) \text{ Additional Profits/Losses Resulting from a Market Condition.}$$

That is, the profit of the smartwatch consists of three parts: a fixed profit of 15 lira and additional profits/losses, which depend on (a) the participant's design choices regarding three key features of the smartwatch and (b) market conditions.

Specifically, each smartwatch has three key features: color (red or green), shape (round or square), and the number of buttons (two or three). The default design is *red, round, and two* buttons. For each of the three features, participants can decide whether to keep the default option or switch to the alternative option. For each feature, keeping the default option will not generate any additional profit or loss (i.e., the profit of the smartwatch would be the fixed 15 lira plus the impact of the market condition), and switching to the alternative will change the profit by an integer between −10 lira and 10 lira. The value of the profit change caused by this switch varies among the three product features. Participants are not informed of the exact values of these changes. However, because the three values remain constant in all periods, participants can infer these values by experimenting with different design choices and comparing the resultant profits. Additionally, the profit of the smartwatch is influenced by an uncontrollable market condition. The impact of the market condition is determined as an integer randomly drawn from the range between −4 lira and 4 lira, and it varies from period to period.

Figure 1A describes the major experimental procedures. After participants arrive at the lab, they read the instructions and complete a comprehension quiz. Only after participants answer all quiz questions correctly can they proceed to the task. Next, participants work on the product-design task for one unpaid practice period and 10 formal periods, with 1 min per period. In each period, participants make product-design choices, and starting from the first formal period, they receive feedback regarding the profit for the period. After all 10 periods are completed, they summarize their task knowledge and decide whether to share knowledge with their coworkers (details are provided later). Participants complete a post-experiment questionnaire before they receive their compensation individually and leave the laboratory.

3.2.2 | Manipulation of Contract Framing

Participants are paid a show-up fee of \$8 and an additional payment contingent on their performance in the product-design task. Specifically, participants are given a contract whereby their cumulative profit over the 10 formal periods is compared with a predetermined target.⁴ We manipulate contract framing between participants. In the Bonus-Framed condition, participants receive a base salary of 50 lira and will receive another 50 lira if their performance meets the target. In the Penalty-Framed condition, participants receive a base salary of 100 lira and will lose 50 lira if their performance misses the target. The lira earned will be converted to cash at the rate of 10 lira to \$1 at the end of the experiment.

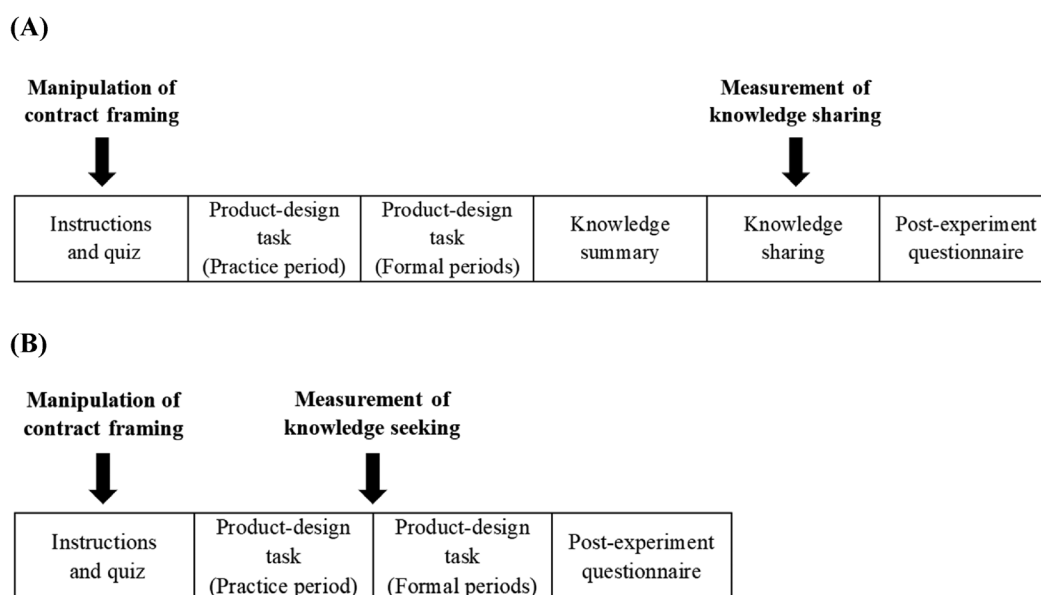


FIGURE 1 | Experiment One procedures. This figure depicts the experimental procedures for (A) provider-participants and (B) seeker-participants, respectively.

3.2.3 | Knowledge Sharing

After completing 10 formal periods, participants are asked to summarize their task-related knowledge by answering two questions. The first question (“Which of the following choices generates a profit at about the average level of profits made by most participants?”) requires them to choose between “Green, Square, Three” (correct answer) and “Green, Round, Three.” The second question (“Which of the following is the impact of the market condition in each of the first five periods?”) asks them to choose between “−4, 4, −3, 2, −4” and “2, −4, 3, 0, −1” (correct answer). Knowing these specific conditions can help knowledge seekers infer the value of profit changes associated with each product feature, potentially enabling them to discover the optimal design choices, albeit with additional effort.⁵

Next, participants are told that another group of participants will work on the same task in a future session as their coworkers, with the same compensation scheme (either Bonus-Framed or Penalty-Framed). To mitigate the potential confounding effect of perceived competition, we clarify that their payoff is independent of the payoff of their coworkers, who will remain unaware of their payoff. Then, participants decide whether to send a coworker task-related knowledge. They have three options: (1) share the product feature choices that yield an average profit (*dependence-oriented knowledge*); (2) share the market conditions in the first five periods (*autonomy-oriented knowledge*); (3) opt not to send any message (*no knowledge sharing*). Choosing to send a message will cost them 5 lira, which simulates the costs of knowledge sharing in practice (Haesebrouck et al. 2021; Bol and Leiby 2022).

3.3 | Part 2: Knowledge Seeking

Figure 1B illustrates the experimental procedures for Part 2. The manipulation of contract framing is similar to that in Part 1. The procedures for seeker-participants are identical to those for provider-participants until the end of the practice period, before proceeding to the 10 formal periods. Specifically, before the start of the formal periods, seeker-participants are informed that another group of participants has completed the same task in a previous session under the same compensation scheme, and they are given the opportunity to seek task-related knowledge at a cost of 5 lira. Seeker-participants can choose one of the three options: (1) information about the set of product feature choices that result in a profit that is approximately the average level achieved by most participants (*dependence-oriented knowledge*); (2) information about the specific impact of the market condition in the first five periods (*autonomy-oriented knowledge*); (3) opt not to request any information (*no knowledge seeking*).⁶

3.4 | Results

3.4.1 | Test of H1

We recruited 130 undergraduate and graduate students from a large public university in the United States to play the role of knowledge providers. The average participant age is 22 years with 2.24 years of work experience. Participants received average earnings of \$14.75, and the experiment lasted approximately 30 min.

Panel A of Table 1 presents descriptive statistics for knowledge sharing, and Figure 2A plots the pattern of results across conditions. Collectively, 31 of 63 participants (49.21%) chose to share knowledge in the Bonus-Framed condition, while only 23 of 67 participants (34.33%) chose to share knowledge in the Penalty-Framed condition. These findings are in line with H1.

Panel B of Table 1 presents the results of logit regressions used to test H1. The independent variable, *Contract_Framing*, equals one for the Penalty-Framed condition and zero for the Bonus-Framed condition. The primary dependent variable is *Knowledge_Sharing*, which equals one if participants provided either dependence-oriented knowledge or autonomy-oriented knowledge, and zero otherwise. As indicated by Model (1), *Contract_Framing* has a significantly negative effect on *Knowledge_Sharing* ($p = 0.044$, one-tailed).⁷ In Model (2), we control for participants' cumulative profit over 10 formal periods (*Cumulative_Profit*) since participants' performance on the task may affect their knowledge-sharing decision, and *Contract_Framing* remains statistically significant ($p = 0.037$, one-tailed).⁸ These results support H1, showing that penalty-framed contracts lead to less knowledge sharing compared with bonus-framed contracts.

We conduct additional tests to address two potential alternative explanations for the results of H1. First, in the experiment, participants summarize task-specific knowledge by answering two multiple-choice questions. Any incorrect

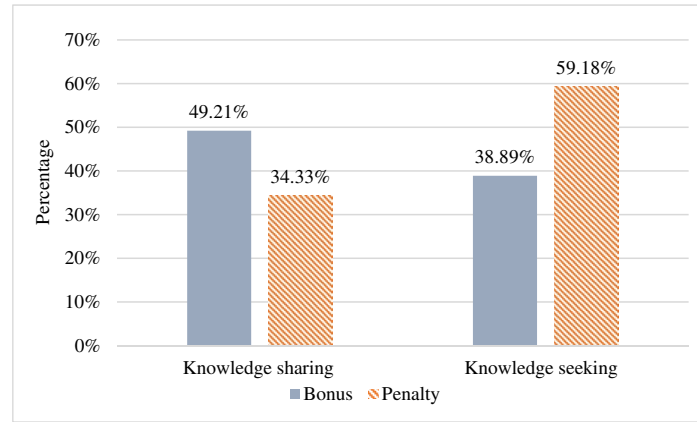
TABLE 1 | Experiment One: Descriptive statistics and hypotheses tests.

Panel A: Frequency and percentage of knowledge sharing				
	Bonus-Framed (N=63)		Penalty-Framed (N=67)	
	Frequency	%	Frequency	%
Dependence-oriented knowledge	21	33.33	11	16.42
Autonomy-oriented knowledge	10	15.87	12	17.91
Knowledge sharing	31	49.21	23	34.33
Panel B: Test of H1—Logit regression (DV = <i>Knowledge_Sharing</i>)				
	Model (1)		Model (2)	
Intercept	−0.032		1.008	
	(0.900)		(0.419)	
<i>Contract_Framing</i>	−0.617*		−0.649*	
	(0.044)		(0.037)	
<i>Cumulative_Profit</i>			−0.006	
			(0.395)	
Pseudo R ²	0.017		0.021	
N	130		130	
Panel C: Frequency and percentage of knowledge seeking				
	Bonus-Framed (N=54)		Penalty-Framed (N=49)	
	Frequency	%	Frequency	%
Dependence-oriented knowledge	8	14.81	9	18.37
Autonomy-oriented knowledge	13	24.07	20	40.82
Knowledge seeking	21	38.89	29	59.18
Panel D: Test of H2—Logit regression (DV = <i>Knowledge_Seeking</i>)				
	Model			
Intercept	−0.452			
	(0.105)			
<i>Contract_Framing</i>	0.824*			
	(0.021)			
Pseudo R ²	0.030			
N	103			

Note: This table presents the descriptive statistics and hypotheses tests of Experiment One. *Contract_Framing* equals one for the Penalty-Framed condition and zero for the Bonus-Framed condition. *Knowledge_Sharing* equals one if participants provide dependence- or autonomy-oriented knowledge, and zero otherwise. *Knowledge_Seeking* equals one if participants seek dependence- or autonomy-oriented knowledge, and zero otherwise. *Cumulative_Profit* is participants' cumulative profit over 10 formal periods. We report *p*-values in parentheses. * indicates a one-tailed test for a directional prediction.

answer triggers an error message and they can only proceed after selecting the correct answer. This design choice ensures that the format, quantity, and quality of knowledge are constant across all participants. However, if participants perceived knowledge gained from error messages differently from knowledge gained through their own task experience, these different perceptions could influence their willingness to share knowledge. To address this, we use the frequency of optimal decisions made over the 10 periods to proxy for the level of knowledge gained from task experience. Untabulated logit analysis shows that, controlling for cumulative profits, *Knowledge_Sharing* is not significantly affected

(A)



(B)

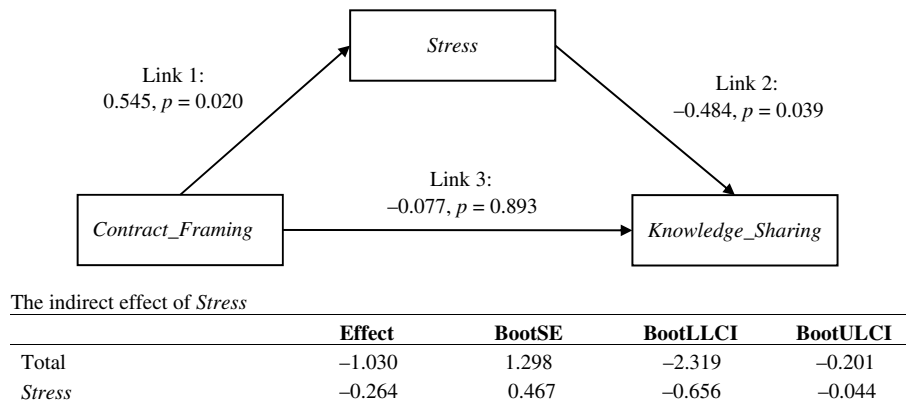


FIGURE 2 | Experiment One descriptive statistics and mediation analysis. (A) Percentages of knowledge sharing and knowledge seeking. (B) Mediation analysis for knowledge providers. This model uses the Hayes (2022, model 4) method to test the mediating effect of stress on the relationship between *Contract_Framing* and *Knowledge_Sharing*, with *Cumulative_Profit* as a covariate and participants' other-regarding concern (measured by a post-experiment item, "Helping my coworker was important to me," 1 = *strongly disagree* and 7 = *strongly agree*) as a controlled mediator. Level of confidence = 90%; bootstrap = 5000. The number of observations is 130. *Contract_Framing* equals one for the Penalty-Framed condition and zero for the Bonus-Framed condition. *Knowledge_Sharing* equals one if participants share dependence- or autonomy-oriented knowledge, and zero otherwise. *Stress* is measured by participants' average response to the following post-experiment question: "To what extent did you feel the following while working on the product-design task? (1) nervous and (2) stressful." Participants respond to each item on a seven-point Likert scale (1 = *not at all* and 7 = *extremely*).

by the frequency of optimal decisions ($p = 0.279$) or its interaction with *Contract_Framing* ($p = 0.501$), providing evidence that the source of knowledge is not likely to influence our main results.

Second, in the experiment, participants decide whether to keep the default option or switch to the alternative option for each design feature. This decision could be influenced by status quo bias—a general tendency to favor the current state over change (Kahneman et al. 1991). To test this, we create a dummy variable (*Switch*) that equals one if the participant switches at least once in a given period, and zero otherwise. We find that the total frequency of *Switch* over the 10 periods does not significantly differ between bonus and penalty conditions ($p = 0.514$). We repeat our hypothesis test after controlling for total *Switch* and statistical inferences remain unchanged. Thus, we find no evidence that our main findings are affected by status quo bias.

3.4.2 | Mediation Analysis for H1

Our theory suggests that penalty-framed contracts increase stress, which reduces participants' willingness to give up personal resources to help others by sharing knowledge. To shed light on the psychological mechanism underlying the relationship between contract framing and knowledge sharing, we conduct a mediation analysis. In the post-experiment questionnaire, we ask participants the extent to which they felt the following while working on the product-design task:

(1) nervous and (2) stressful (1 = *not at all* and 7 = *extremely*). We measure participants' stress using the average of these two items, labeled *Stress* (Cronbach's $\alpha = 0.834$). We use the Hayes (2022, model 4) method to test the mediation effect of stress on the relationship between contracting framing and knowledge sharing.

As reported in Figure 2B, controlling for *Cumulative_Profit*, *Contract_Framing* has a significantly positive effect on *Stress* (Link 1: $p = 0.020$), indicating that participants experience greater stress under penalty-framed contracts (2.71) than under bonus-framed contracts (2.14). Furthermore, *Stress* has a negative effect on *Knowledge_Sharing* (Link 2: $p = 0.039$), showing that participants' stress reduces their willingness to share knowledge. Overall, the indirect effect of stress on the relationship between contract framing and knowledge sharing is significant (90% CI: $[-0.656, -0.044]$), suggesting that participants' perceived stress underlies our main results.⁹

3.4.3 | Test of H2

In Part 2, we recruited 103 students from the same university as in Part 1 to play the role of knowledge seekers. The demographic information of seeker-participants is similar to that of provider-participants: their average age is 22 years, average work experience is 2.83 years, received average earnings were \$14.26, and the experiment lasted about 30 min.

Panel C of Table 1 reports the descriptive statistics for knowledge seeking, and Figure 2A shows the pattern of knowledge seeking in Bonus-Framed and Penalty-Framed conditions. In the Bonus-Framed condition, 21 of 54 participants (38.89%) chose to seek knowledge. By comparison, in the Penalty-Framed condition, 29 of 49 participants (59.18%) chose to seek knowledge. These findings align with H2, which predicts that employees are more likely to seek knowledge under penalty-framed contracts compared with bonus-framed contracts.

Next, we use a logit regression to formally test H2. The dependent variable, labeled *Knowledge_Seeking*, is a dummy variable that equals one if participants seek either dependence- or autonomy-oriented knowledge, and zero otherwise. The independent variable, *Contract_Framing*, is defined in the same way as Part 1. As indicated in Panel D of Table 1, *Contract_Framing* has a significantly positive effect on *Knowledge_Seeking* ($p = 0.021$, one-tailed), which supports H2.¹⁰

3.5 | Analyses of Task Performance

3.5.1 | Task Performance of Knowledge Providers

We also test whether contract framing affects knowledge providers' task performance. Panel A of Table 2 presents descriptive statistics of knowledge providers' cumulative profits and percentages of meeting the target. We first run an OLS regression with *Cumulative_Profit* as the dependent variable and *Contract_Framing* as the independent variable, and then run a logit regression with whether participants meet the predetermined target, labeled *Meet_Target*, as the dependent variable. Untabulated results show that *Contract_Framing* does not have a significant effect on either *Cumulative_Profit* ($p = 0.305$) or *Meet_Target* ($p = 0.239$). This finding deviates from prior studies where penalty-framed contracts were shown to result in better performance than bonus-framed contracts (Hannan et al. 2005; Church et al. 2008; Hossain and List 2012). This deviation could be due to the higher uncertainty in our product-design task, which may weaken the association between effort and performance.¹¹ Additionally, this result suggests that participants' performance is not likely to be an alternative explanation for how contract framing affects knowledge sharing (Kidd et al. 2013; Endres and Rhoad 2016).

3.5.2 | Task Performance of Knowledge Seekers

We next examine how seeking knowledge affects performance under bonus- versus penalty-framed contracts. Panel B of Table 2 reports descriptive statistics of knowledge seekers' cumulative profits and percentages of meeting the target. We create an ordinal variable, *Knowledge_Seeking2*, which equals 0 for no knowledge seeking, 1 for autonomous knowledge seeking, and 2 for dependent knowledge seeking. We conduct an ANOVA test with *Cumulative_Profit* as the dependent variable, with *Contract_Framing*, *Knowledge_Seeking2*, and their interaction as the independent variables. Untabulated results show that the main effect of *Contract_Framing* ($p = 0.852$) and the interaction effect ($p = 0.827$) are not significant. There is a significant main effect of *Knowledge_Seeking2* ($p = 0.001$). Pairwise *t*-tests show that, compared with participants who do not seek knowledge (mean = 174.81), those who seek autonomy-oriented

TABLE 2 | Experiment One: Task performance.

Panel A: Knowledge providers						
	Bonus-Framed (N= 63)			Penalty-Framed (N= 67)		
	Mean		SD	Mean		SD
Cumulative_Profit	184.89		27.31	179.91		27.73
Meet_Target	0.44		0.50	0.34		0.48
Panel B: Knowledge seekers						
	Dependence-oriented knowledge (N= 17)		Autonomy-oriented knowledge (N= 33)		No knowledge seeking (N= 53)	
	Mean	SD	Mean	SD	Mean	SD
Cumulative_Profit	159.41	16.93	189.82	28.84	174.81	26.31
Meet_Target	0.00	0.00	0.52	0.51	0.26	0.45

Note: This table presents the task performance of Experiment One. *Cumulative_Profit* is participants' cumulative profit over 10 formal periods. *Meet_Target* equals one if participants' cumulative profit over 10 formal periods meets the predetermined target set by the company, and zero otherwise.

knowledge have higher cumulative profit (mean = 189.82, $p = 0.015$), suggesting that seeking autonomy-oriented knowledge contributes to performance improvement, but those who seek dependence-oriented knowledge perform worse (mean = 159.41, $p = 0.027$).¹²

3.6 | Supplemental Experimental Data and Robustness Analyses

Consistent with prior experimental accounting research (e.g., Hannan 2005; Kuang and Moser 2009; Choi et al. 2020), in the main experiment we impose monetary costs to proxy for disutilities from knowledge sharing and seeking. However, this design choice could have made the cost more salient than may be the case in practice. Therefore, we conduct two supplemental experiments to test the robustness of our main results in settings where the cost of knowledge transfer is less explicit and salient.

3.6.1 | Supplemental Experiment 1

The first supplemental experiment is similar to the main experiment except for one key modification: if participants choose to share or seek knowledge, they will answer a series of two-digit by two-digit multiplication questions (e.g., 12×18) using pencil and paper for 5 min.¹³ This design is analogous to settings where sharing knowledge with coworkers requires additional effort. We recruited 102 participants to play the role of knowledge providers. We find that 37 of 50 participants (74.00%) share knowledge in the Bonus-Framed condition, whereas 21 of 52 participants (40.38%) share knowledge in the Penalty-Framed condition. Untabulated logit regression shows that, controlling for *Cumulative_Profit*, *Contract_Framing* has a significantly negative effect on *Knowledge_Sharing* ($p = 0.001$). These results lend additional support to H1 that penalty framing hinders knowledge sharing compared with bonus framing.¹⁴

We then recruited 64 participants to assume the role of knowledge seekers. Of these, 17 of 39 participants (43.59%) seek knowledge in the Bonus-Framed condition, whereas 8 of 25 participants (32.00%) engage in knowledge seeking in the Penalty-Framed condition. Untabulated logit regression reveals that this difference is not statistically significant ($p = 0.356$). Therefore, we do not find support for H2.

3.6.2 | Supplemental Experiment 2

In the second supplemental experiment, the cost of knowledge sharing is operationalized as having a lower probability of earning an additional bonus. Specifically, after the product-design task is finished, participants have an 80%

probability of gaining 10 lira, which is independent of their pay from the product-design task. If participants choose to share knowledge, their probability of gaining the 10 lira will become 30%. This design simulates settings where sharing knowledge with coworkers diverts time and energy that could otherwise be used to increase the employee's own performance and, in turn, compensation. We keep all other design features identical to those of the main experiment.

We recruited 76 participants to act as knowledge providers. Of these, 18 of 31 participants (58.06%) share knowledge in the Bonus-Framed condition, whereas 18 of 45 participants (40%) share knowledge in the Penalty-Framed condition. Untabulated logit regression shows that, controlling for *Cumulative_Profit*, *Contract_Framing* has a marginally significant negative effect on *Knowledge_Sharing* ($p = 0.092$, one-tailed). These results further support H1 that compared with bonus framing, penalty framing reduces knowledge sharing.¹⁵

Finally, we recruited 38 participants to act as knowledge seekers for the second supplemental experiment. We find that 72.22% of the participants choose to seek knowledge under the penalty-framed contract, whereas only 40% do so under the bonus-framed contract. Untabulated logit regression shows that this difference is statistically significant ($p = 0.026$, one-tailed) and thus provides further evidence supporting H2.

4 | Experiment Two

4.1 | Motivation and Background

The results of Experiment One indicate that penalty-framed contracts increase stress and, in turn, dampen employees' willingness to share knowledge. The purpose of Experiment Two is twofold. The first purpose is to provide insights into how firms can counteract the adverse effect of penalty-framed contracts on knowledge sharing that we observe in Experiment One. According to the job demands-resources model, firms can reduce employee stress by enriching job resources—defined as the physical, psychological, social, or organizational aspects of the job that help employees achieve work goals, reduce physiological and psychological costs, or promote personal growth and development (Demerouti et al. 2001; Bakker and Demerouti 2007). Consistent with this model, prior accounting research suggests that firms can use informal controls to shape employees' beliefs and attitudes (Herremans and Nazari 2016; Spallek et al. 2023), thereby mitigating work-related stress and eliminating its negative impact (e.g., Edmondson 2011; Q. Cheng and He 2017). One such type of informal control is corporate value statements, which convey desired social norms and guide the behaviors and attitudes that firms seek to promote among employees (Kachelmeier et al. 2016; Akinyele et al. 2020, 2022). While value statements are pervasive across organizations, they are often used for broader purposes (e.g., mission statements; mottos; slogans; advertising taglines) (Hannan 2016). We argue that firms can strategically craft value statements in order to foster a positive employee mindset toward potential failures and negative outcomes resulting from their efforts (e.g., missing performance targets), thereby proactively easing stress or anxiety that might otherwise arise in such situations, especially in the case of penalty-framed contracts.

The second purpose of Experiment Two is to further test the psychological mechanism (i.e., stress) underlying the main findings of Experiment One. Our theory suggests that a penalty-framed contract (compared with a bonus-framed contract) induces higher stress, which in turn reduces knowledge sharing. Since stress is central to our theory, we adapt Asay et al.'s (2022) moderation-of-process approach to shed light on the mediating role of stress. Specifically, we focus on situations where participants are unlikely to experience more stress under penalty-framed contracts compared with bonus-framed contracts. In this setting, we expect that the penalty-framed contract will *not* lead to less knowledge sharing compared with the bonus-framed contract.

4.2 | Experiment Two, Part 1: Knowledge Sharing

4.2.1 | Experimental Design and Validation

The design (where contract framing is manipulated as bonus-framed vs. penalty-framed) and procedures of Experiment Two are similar to those in Experiment One, with one key change. Specifically, after learning about the contract scheme, but before starting the product-design task, participants in both conditions read the following corporate value statement: “Don't fear failure; it's a sign that you're pushing boundaries and making progress. Don't think about future outcomes—think about what you need to do in the present moment.”

Prior to conducting Experiment Two, we conducted an online study at Prolific to validate the effectiveness of this value statement in reducing stress related to working under target-based incentive contracts. Participants read descriptions of either a bonus-framed contract or a penalty-framed contract and then answered two questions adapted from our measures of stress in Experiment One—"To what extent would you feel stressful working under this contract?" and "To what extent would you feel nervous working under this contract?"—on a seven-point Likert scale (1 = *not at all*; 7 = *extremely*). We use the average of these two ratings to measure participants' stress level. Next, participants read the value statement we used in Experiment Two and then responded to the same two stress questions. We focus on the difference between pre- and post-tests to examine the extent to which the value statement alleviates stress.

Untabulated results show that, consistent with the results of Experiment One, before participants read the value statement, the penalty-framed contract (5.89) leads to more stress ($p < 0.001$) than the bonus-framed contract (4.25). Importantly, the value statement significantly reduces stress under both penalty-framed (before: 5.89 vs. after: 2.85, $p < 0.001$, one-tailed) and bonus-framed contracts (before: 4.25 vs. after: 3.84, $p = 0.070$, one-tailed). Collectively, these findings provide evidence that the value statement is a valid tool for stress alleviation.

4.2.2 | Experiment Two, Part 1, Results: Knowledge Sharing

A total of 108 students (with an average age of 22 years and average work experience of 1.81 years) from the same university as those in Experiment One participate in Part 1 of Experiment Two. As expected, we find that, when the value statement is present, stress levels do not differ ($p = 0.932$, untabulated) between bonus-framed (2.61) and penalty-framed (2.58) contracts. We then examine knowledge-sharing behavior between these two contracts. Panel A of Table 3 presents the descriptive statistics for knowledge sharing. In the Bonus-Framed condition, 31 of 52 participants (59.62%) chose to share knowledge, while in the Penalty-Framed condition, 30 of 56 participants (53.57%) chose to share knowledge. Panel B of Table 3 presents the results of logit regressions. Consistent with our expectation, as indicated by Model (1), *Contract_Framing* does not significantly influence *Knowledge_Sharing* ($p = 0.527$). Model (2) results, which control for participants' cumulative profit (*Cumulative_Profit*), are similar ($p = 0.476$). Together, these results provide evidence that the value statement mitigates the levels of stress between the two incentive contract frames, resulting in no difference in the extent of knowledge sharing. These results also provide additional evidence consistent with our main theory that

TABLE 3 | Experiment Two: Knowledge sharing.

Panel A: Frequency and percentage of knowledge sharing				
	Bonus-Framed (N = 52)		Penalty-Framed (N = 56)	
	Frequency	%	Frequency	%
Dependence-oriented knowledge	19	36.54	20	35.71
Autonomy-oriented knowledge	12	23.08	10	17.86
Knowledge sharing	31	59.62	30	53.57
Panel B: Logit regression (DV = <i>Knowledge_Sharing</i>)				
	Model (1)		Model (2)	
Intercept	0.389		3.212	
	(0.168)		(0.040)	
<i>Contract_Framing</i>	−0.246		−0.283	
	(0.527)		(0.476)	
<i>Cumulative_Profit</i>			−0.016	
			(0.064)	
Pseudo R^2	0.003		0.027	
N	108		108	

Note: This table presents the results on knowledge sharing of Experiment Two. *Contract_Framing* equals one for the Penalty-Framed condition and zero for the Bonus-Framed condition. *Knowledge_Sharing* equals one if participants provide dependence- or autonomy-oriented knowledge, and zero otherwise. *Cumulative_Profit* is participants' cumulative profit over 10 formal periods. We report p -values in parentheses.

the stress induced by a penalty-framed contract drives our main result in Experiment One that knowledge sharing is significantly less compared with bonus-framed contracts.

4.3 | Experiment Two, Part 2: Knowledge Seeking

Forty-eight students participate as knowledge seekers (the average age is 21 years, with 2.27 years of work experience). The experimental setup is the same as Part 2 of Experiment One and the value statement is not provided to knowledge seekers. Accordingly, we expect their behavior to be consistent with that in Experiment One. Consistent with this expectation, untabulated results show that participants under penalty-framed contracts (50.00%) are more likely ($p=0.028$, one-tailed) to seek knowledge than those under bonus-framed contracts (23.08%).¹⁶

4.4 | Additional Analysis

To shed further light on the role of value statements in mitigating the effect of penalty-framed contracts on knowledge sharing, we conduct a pseudo cross-experiment analysis by pooling knowledge-provider data from Experiments One and Two.¹⁷ We create a dummy variable, *Value_Statement*, which equals zero for Experiment One (when the value statement is absent) and one for Experiment Two (when the value statement is present). We first conduct an ANCOVA with *Knowledge_Sharing* as the dependent variable; *Contract_Framing*, *Value_Statement*, and their interaction as independent variables; and *Cumulative_Profit* as a covariate. As shown in Panel A of Table 4, the interaction effect is not statistically significant ($p=0.229$, one-tailed). However, because we expect a directional interaction such that penalty-framed contracts reduce knowledge sharing in the absence of the value statement but not when it is present, the appropriate test is a contrast analysis (Guggenmos et al. 2018). As reported in Panel B of Table 4, a contrast analysis reveals that the predicted interaction effect is significant ($p=0.004$, one-tailed) and the residual test is not significant ($p=0.916$; $q^2=0.024$). Furthermore, simple-effects tests show that penalty-framed contracts significantly decrease knowledge sharing when the value statement is absent ($p=0.033$, one-tailed) but not when it is present ($p=0.497$). Taken together, these results provide additional evidence consistent with our theory.

TABLE 4 | Pseudo cross-experiment analysis.

Panel A: ANCOVA (DV = <i>Knowledge_Sharing</i>)					
Source of variation	Partial SS	df	MS	F	p
<i>Contract_Framing</i>	0.74	1	0.74	3.05	0.082
<i>Value_Statement</i>	0.93	1	0.93	3.85	0.051
<i>Contract_Framing</i> × <i>Value_Statement</i>	0.13	1	0.13	0.56	0.229*
<i>Cumulative_Profit</i>	0.81	1	0.81	3.32	0.070
Error	56.49	233	0.24		
Panel B: Contrast analysis and simple effects					
Source of variation	Partial SS	df	MS	F	p
The predicted interaction [+1, +1, -3, +1]	1.77	1	1.77	7.28	0.004*
Residual test	0.04	2	0.02	0.09	0.916
Simple effect of <i>Contract_Framing</i> conditional on		df		F	p
No Value Statement		1		3.42	0.033*
Value Statement		1		0.46	0.497

Note: This table presents the results of pseudo cross-experiment analysis. *Contract_Framing* equals one for the Penalty-Framed condition and zero for the Bonus-Framed condition. *Value_Statement* equals one for the Value Statement condition and zero for the No Value Statement condition. *Knowledge_Sharing* equals one if participants provide dependence- or autonomy-oriented knowledge, and zero otherwise. *Cumulative_Profit* is participants' cumulative profit over 10 formal periods. We use the following contrast weights: -3 for the Penalty/No Value Statement condition and +1 for the other three conditions. * indicates a one-tailed test for a directional prediction.

5 | Conclusion

In recent years, knowledge management has emerged as a top priority and key driver of business success (Koenig 2018; Becker and Behme 2021). Despite its importance, both anecdotal and academic evidence reveal a lack of active engagement in knowledge transfer among employees in the workplace (Peng 2013; Serenko and Bontis 2016; Gagné et al. 2019). In this paper, we experimentally investigate whether the framing of target-based incentive contracts as a bonus versus a penalty—a control system design feature that is seemingly unrelated to knowledge transfer—affects the propensity to share or seek knowledge. We predict and find that individuals are less likely to share knowledge under penalty-framed contracts relative to bonus-framed contracts. We provide evidence that stress induced by a penalty-framed contract weakens employee motivation to share knowledge with coworkers. In addition, we find that corporate value statements designed to promote a positive work attitude can reduce the stress caused by the penalty-framed contract and mitigate its negative impact on knowledge sharing. We also predict and find that participants are more likely to seek knowledge under penalty-framed contracts relative to bonus-framed contracts. This suggests that compared with those under bonus-framed contracts, employees with penalty-framed contracts are more likely to perceive the benefits of seeking knowledge as surpassing its psychological and economic costs.

The results of this paper contribute to accounting research and practice in several ways. First, our study advances the knowledge transfer literature by demonstrating that, while directly incentivizing knowledge seeking and sharing can be challenging (Haesebrouck et al. 2021), contract framing can nonetheless have an impact on both behaviors. Companies should consider these effects when designing incentive contracts. Second, our study highlights the negative impact of penalty-framed contracts on knowledge sharing, adding to the literature on why penalty-framed contracts are less common than bonus-framed contracts in practice (Gonzalez et al. 2020). Third, our findings highlight the role of stress induced by penalty-framed contracts in knowledge sharing. Our study suggests that when developing management control systems, companies should be mindful of the potential for stress to be inadvertently triggered, which can lead to unintended negative consequences in knowledge management. Finally, our study contributes to both research and practice by identifying corporate value statements as an informal control mechanism that can alleviate the stress associated with penalty-framed contracts. In this way, our paper not only highlights a potential challenge but also offers a practical solution, providing firms with actionable insights to enhance knowledge transfer among their employees.

The limitations of our study provide fruitful opportunities for future research. First, we embed a relatively high level of environmental uncertainty into the product-design task to mitigate the confounding effect of task performance on knowledge sharing. Given that employees in organizations work on tasks with various degrees of uncertainty (Choi et al. 2020; Cardinaels et al. 2024), it is interesting to investigate how uncertainty interacts with contract framing to influence employees' knowledge-related decisions. Second, while we document a negative effect of penalty framing on knowledge sharing, the stress caused by penalty-framed contracts may have similar effects on other types of organizational citizenship behaviors. Future studies could examine these effects and thus help to develop a more comprehensive understanding of how contract framing influences overall workforce citizenship characteristics that are beneficial to organizational efficiency. Finally, while our study focuses on the role of stress in knowledge sharing, future research can explore how stress affects knowledge seeking across different organizational contexts. For example, stress may increase knowledge seeking under high-pressure conditions but could reduce it when employees are concerned about preserving a positive image or reputation (e.g., when competing for promotions). Examining these boundary conditions can offer valuable insights and expand our understanding of the role of stress in organizational practices.

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Data Availability Statement

The data that support the findings of this study are available from the authors upon reasonable request.

Endnotes

- ¹ For example, in healthcare organizations, effective task execution often requires close collaboration among medical professionals, and knowledge transfer is crucial for ensuring efficiency and productivity (Anderson 2021). As another example, in recent years

the role of middle management in organizations has become increasingly important (Zhang 2023). Middle managers' work is interdependent with personnel above, at, and below their level, positioning them as a key facilitator of knowledge transfer across hierarchical layers (Sohn 2021; Boutcher et al. 2022; Young 2025).

- ² In fact, in tasks where output primarily depends on work effort (as explored in prior research), increasing effort to improve performance could provide psychological benefits, such as enhancing perceived competence and strengthening self-esteem (Hallsten et al. 2005). By comparison, we examine employees' behavior when these potential benefits may not be present and, instead, they face psychological costs that diminish perceived competence and self-esteem.
- ³ We obtained approvals from the university's institutional review board for conducting the experiments.
- ⁴ To determine the target, we conduct a pilot study where 25 participants perform the same product-design task under a piece-rate incentive. To make sure the target is challenging but motivating, we set the target at around the 70th percentile of the cumulative profit from the pilot study (Locke 2004). The target shows on the screen when participants work on the task in 10 formal periods.
- ⁵ These two questions are designed to elicit two different types of knowledge. The first question simulates dependence-oriented knowledge (i.e., immediate solutions to the problem that may not yield the most profit), whereas the second question simulates autonomy-oriented knowledge (i.e., hints or tools for solving the problem), which has the potential to maximize profits (Nadler 1997, 1998; Voermans et al. 2024). For each question, participants choose one of two answers. If they choose the wrong answer, they receive the message "Incorrect. Please choose again" and can only proceed after they answer both questions correctly. These design choices help hold constant the format, quantity, and quality of knowledge items across all participants (Berger et al. 2019) and rule out the alternative explanation that participants may be unwilling to share knowledge due to the unavailability of their preferred type.
- ⁶ Seeker-participants are not matched one-on-one with provider-participants. This approach allows seeker-participants who seek knowledge to receive the type of knowledge they choose.
- ⁷ The p -values are two-tailed unless otherwise specified.
- ⁸ The type of knowledge shared (dependence- vs. autonomy-oriented) does not significantly differ ($p = 0.165$) between the Bonus-Framed and Penalty-Framed conditions.
- ⁹ An alternative explanation to our main finding is that relative to bonus framing, penalty framing leads to less knowledge sharing by weakening employees' other-regarding concern, as individuals under penalty (vs. bonus) framing are more likely to adopt a selfish rather than other-regarding perspective (Feldman et al. 2013). To examine this, we measure participants' other-regarding concern using a post-experiment item, "Helping my coworker was important to me" (1 = *strongly disagree* and 7 = *strongly agree*). The average rating is lower in the penalty condition (4.28) than in the bonus condition (4.79; $p = 0.069$, one-tailed), suggesting that penalty framing can indeed reduce other-regarding concern. We include this measure as an additional mediator in the mediation analysis reported in Figure 2B. The indirect effect of this variable is not significant (90% CI: $[-1.927, 0.047]$), suggesting that other-regarding concern does not account for the observed behavior.
- ¹⁰ Recall that, per the research purpose of Part 2, participants can get help from previous participants before starting the formal periods of the task, which potentially reduces their stress during the task process. In addition, the type of knowledge sought (dependence- vs. autonomy-oriented) does not differ ($p = 0.603$) between Bonus-Framed and Penalty-Framed conditions.
- ¹¹ Examples of real-effort tasks used in the literature of contract framing include the decoding task (e.g., Church et al. 2008; Libby and Olczak 2023), multiple-choice questions (e.g., Luft 1994; Nichol 2019), data identification task (Burke et al. 2023), and data entry task (de Quidt 2018). These tasks usually involve a low level of uncertainty.
- ¹² This result is not entirely unexpected since the dependence-oriented knowledge in the task was designed to only lead to a solution that yields an "average" profit. Another possible explanation is that reliance on dependence-oriented knowledge hinders participants' performance because it discourages deeper, more deliberate thinking (Nadler 1998; Komissarouk and Nadler 2014). It is also possible that the type of knowledge sought might reflect individual differences in task motivation—for instance, individuals who seek autonomy-oriented knowledge are more likely to adopt a mastery goal orientation (i.e., strive for greater competence and task mastery), whereas those who seek dependence-oriented knowledge may be more inclined toward an avoidance goal orientation (i.e., avoid appearing less competent) (Komissarouk et al. 2017).
- ¹³ To ensure the privacy of participants' decision of knowledge sharing or seeking, we ask all participants to leave the lab after they finish the post-experiment questionnaire and receive the payment. Then participants who choose to share or seek knowledge are directed to another room to work on the multiplication task.
- ¹⁴ Although stress is directionally higher under a penalty-framed contract (3.11) than under a bonus-framed contract (2.82), the difference is not statistically significant ($p = 0.343$).
- ¹⁵ In Part 1 of Supplemental Experiment 2, stress is directionally higher under a penalty-framed contract (3.06) than under a bonus-framed contract (2.74), but this difference is not statistically significant ($p = 0.389$).
- ¹⁶ We add a post-experiment question to explore whether the experience of working under a specific contract frame influences the intention of (future) knowledge sharing: "How likely would you be to take the time to share information on how to perform the task with co-workers?" (1 = *very unlikely* and 7 = *very likely*). We do not find a significant difference between the two conditions

(Bonus-Framed: 5.35 vs. Penalty-Framed: 5.64, $p = 0.389$). However, these responses need to be interpreted with caution because they are not incentive-compatible.

¹⁷ Participants' gender, age, or work experience do not differ significantly between Experiments One and Two ($p \geq 0.191$). It is important to interpret the results of this cross-experiment analysis with caution, as the two experiments were conducted at different times and participants were not randomly assigned to the experiments.

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