Who is More Useful? The Effects of Performance Incentives on Social Activities
Abstract

Most working adults report spending very little time with friends and family. The current research examines which aspects of work encourage employees to spend less time with their close ties. Our data suggests that incentive systems play a critical role in shaping how employees allocate time to different relationship partners. Across three experiments, one survey, and one large-scale archival data set ($N = 131,903$), exposure to performance incentives encouraged employees to spend more time with work colleagues, even if it prevented them from spending time with friends and family. We also documented perceived instrumentality as a mechanism for these results: performance incentives led individuals to perceive their work relationships as more instrumental. These findings suggest that incentive systems shape people’s perceptions of and interactions with critical relationship partners.

*Keywords*: Rewards, performance incentives, social relationships, instrumentality, time allocation
Socializing with friends and family is one of the happiest moments of our day (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Mogilner, Whillans & Norton, 2018). However, many working adults are spending very little time with their loved ones. In an average week, employees in the United States spend less than an hour of quality time per day with their family (Paul, 2018) and less than an hour per day with their friends (US Department of Labor Statistics, 2015). Why is this the case? One potential answer could lie in a ubiquitous circumstance that the majority of workers cannot avoid— incentive systems. We argue that how people are paid for their work shapes how they think about and interact with various relationship partners, such as their colleagues, friends, and family. We inspect the role of one of the most common incentive systems, performance incentives, in shaping everyday social interactions.

In a performance incentive system, people receive rewards if they meet or exceed a specific standard of performance on a task (Rusbult, Campbell, & Price, 1990; Shomstein & Johnson, 2013). Research has examined whether performance incentives impact performance (Jenkins Jr, Mitra, Gupta, & Shaw, 1998), intrinsic motivation (Eisenberger, Rhoades, & Cameron, 1999), and attention (Beilock & Carr, 2005) as compared to other non-performance incentive systems, such as fixed salaries. Building on this line of work, we suggest that this common incentive system also shapes the way that people think about their different relationship partners and influences their social lives in and outside of organizations. Specifically, we predict that exposure to performance incentives will increase the perceived instrumentality of work relationships and increase the amount of time allocated to these relationships—often at the expense of spending time with personal relationship partners like friends and family.

Performance Incentives
Performance incentives are believed to increase productivity and are used across a variety of domains, including education, health, and management (Ryan & Deci, 2000). In the domain of education, providing performance incentives for academic achievement tends to increase students' grades and effort (Allan & Fryer, 2011). In the domain of health, rewarding patients with money for achieving specific goals can improve health behaviors, such as smoking cessation (Juliano, Donny, Houtsmuller, & Stitzer, 2006) and medication adherence (DeFulio & Silverman, 2012). In the management domain, performance incentives are pervasive across industries: sales agents receive cash bonuses for sales, call center employees earn commissions for calls, and CEOs receive stock options based on quarterly earnings (Lazear, 2000; Stroh, Brett, Baumann, & Reilly, 1996). In the United States, 75% of organizations employ some form of performance-based incentives (Harrison, 2019).

Given their wide range of applications, performance incentives have garnered a great deal of attention from researchers. The previous literature has focused primarily on two direct consequences: whether performance incentives improve performance (Jenkins Jr et al., 1998) and whether performance incentives undermine intrinsic motivation (Cameron, Pierce, Banko & Gear, 2005). Stated differently, prior research has mostly focused on examining how performance incentives shape people’s efforts and underlying attitudes towards a specific, incentivized task (Eisenberger, Rhoades, & Cameron, 1999; Harrison, Virick, & William, 1996; Miceli, Jung, Near, & Greenberger, 1991).

Moving beyond these investigations, research has started to examine the consequences of performance incentives for values and actions not directly tied to incentivized tasks. Exposure to performance incentives can increase gender bias (Castilla & Benard, 2010), decrease ethical behavior (Larkin, Pierce, & Gino, 2012), and increase the value that people attach to money (Hur
In the current research, we propose that performance incentives might also have consequences for social interactions. Specifically, we argue that the social consequences of performance incentives should depend on whether a relationship partner is perceived to be instrumental for the goal of earning monetary incentives. We predict that individuals in a performance-incentive system will spend more time with people who are task-relevant (e.g., colleagues)—even if this comes at the cost of interacting with friends and family from whom individuals often derive a great deal of happiness.

**Performance Incentive and Social Relationships**

These propositions are built on two lines of research that appear to predict opposing effects of performance incentives on social interactions. One line of research suggests the possibility that performance incentives decrease the motivation to socialize by focusing people’s attention on money. Focusing on money can promote self-sufficient behavior (Bianchi & Mohliver, 2016; Lea & Webley, 2006; Vohs, Mead, & Goode, 2006) and encourage people to work alone and socialize less (Hershfield, Mogilner, & Barnea, 2016; Whillans & Dunn, 2018; Whillans, Weidman & Dunn, 2016). A recent conceptual review points to the possibility that reminders of money lead people to focus on maximizing economic gains and to spend less time with their loved ones (Vohs, 2015, see also: c.f. Caruso, Shapira, & Landy, 2017).

In contrast to the aforementioned research, another line of research suggests that performance incentives increase social interactions. Prior research has shown that employees who were paid for their team’s performance had more frequent social interactions and greater cooperation with their colleagues as compared to those who were paid for individual performance (Dur & Sol, 2010). Likewise, financial incentives tend to increase one’s motivation
to connect and cooperate with others working on the same task (Berger, Herbertz & Sliwka, 2011), suggesting that exposure to performance incentives can increase social interactions.

The current work attempts to reconcile this contrasting evidence on the effects of performance incentives on social interactions by examining the role of perceived instrumentality of interaction partners. The perception that other people are helpful for achieving one’s focal goals can play an important role in relationship formation (Gruenfeld, Inesi, Magee, & Galinsky, 2008). We argue that performance incentives could have diverging effects on social interactions depending on the type of relationship under examination and how instrumental the relationship is for achieving the goal of making more money. We therefore examine how performance incentives impact willingness to socialize with work ties and with non-work, personal ties and test whether employees’ willingness to socialize is driven by perceived instrumentality.

**Performance Incentive and Relationship Instrumentality**

Performance incentives make reward-seeking goals more salient (Beilock & Carr, 2005; Markman, Maddox, & Worthy, 2006). Employees who receive performance incentives tend to think about the goal of making money more often than those who do not receive performance incentives, even when working on the same task and receiving the identical reward (Hur & Nordgren, 2016). For example, when salespeople receive a bonus every time that they sell a car, each sale serves as a reminder of money (i.e., a reward) and reinforces the broad goal of making more money (i.e., a reward-seeking goal). Previous research on cognitive control provides support for this theorizing (Shah, Friedman, & Kruglanski, 2002) demonstrating that frequent exposure to goal-related stimuli can increase the mental accessibility of the goal (Chartrand & Bargh, 1996). Once the goal becomes accessible, this accessibility further biases one’s attention, perception, and behavioral systems in a goal-driven manner (Hur, Koo, & Hofmann, 2015).
We argue that the reward-seeking goal brought on by performance incentives biases social interactions in a goal-driven manner by shaping the perceived instrumentality of various relationship partners. Perceived instrumentality – the degree to which another person is seen to be helpful in achieving one’s focal goal – plays an important role in relationship formation (Belmi & Pfeffer, 2018; Gruenfeld et al., 2008). Individuals can perceive a person as “useful” for several reasons: the other person might have access to resources (Shea & Fitzsimons, 2016), keep them away from temptations (Gallant, Spitze, & Prohaska, 2007), or provide emotional support to persist in goal pursuit (Brunstein, Dangelmayer, & Schultheiss, 1996). Once other people are perceived as “useful” for accomplishing a focal goal, they are evaluated more positively (Fitzsimons & Shah, 2008) and prioritized (Gruenfeld et al., 2008).

Building on this line of research, we suggest that in a performance-incentive system, the degree to which another person is helpful in achieving one’s focal goal of making more money could play an important role in relationship formation. Here, we focus on two critical types of relationship partners—work ties and personal ties. We propose that exposure to performance incentives will increase the amount of time and effort that people spend interacting with work partners, because these relationships are perceived as more instrumental. Under performance incentives, people should see a work partner as more instrumental when they believe that this person helps them progress towards their goal of making more money. Given that time is a limited resource, when they decide to spend more time with one relationship partner, they tend to spend less time with other relationship partners (Greenhaus & Beutell, 1985). Thus, exposure to performance incentives should decrease the amount of time that people spend with personal relationship partners, such as friends and family, who are less instrumental for performance relevant goals. Consistent with our proposition, research has studied spending time with work
ties vs. personal ties as an explicit trade-off (e.g., Bianchi & Vohs, 2016; Hershfield, Barnea & Mogilner, 2016; Whillans, Weidman & Dunn, 2016; Whillans & Dunn, 2018). Following from this research, we examine the effect of performance incentives on the trade-offs that people make between these two relationship partners. More formally, we propose the following hypotheses:

**Hypothesis 1**: Exposure to performance incentives will increase prioritization of work relationships (e.g., work colleagues) over personal relationships (e.g., friends and family).

**Hypothesis 2**: Exposure to performance incentives will increase the perceived instrumentality of work relationships.

**Hypothesis 3**: The effect of performance incentives on prioritization of work relationships will be mediated by increases in perceived instrumentality of work relationships.

**Current Research**

We examined these hypotheses across five studies using a variety of samples, measures, and designs including three experiments, one survey, and one archival data set. Study 1 examined whether performance incentives increased participants’ willingness to prioritize work ties over personal ties. We also tested our proposed mechanism: the increased perceived instrumentality of work ties. Study 2 replicated these results and further tested the role of perceived instrumentality by examining the moderating role of peer dependence. Study 3 tested the effect of performance incentives using a behavioral intention measure—the number of minutes that participants allocated toward interacting with work ties. Study 4 tested these hypotheses using a direct measure of the trade-offs that employees often experience between interacting with work ties and personal ties. Study 5 replicated the main social interaction findings in an ecologically valid context by using a nationally representative sample of working adults in the United States (American Time Use Survey). We pre-registered the sample sizes,
measures, hypotheses, and analyses for the three experiments and one survey through the Open Science Framework (https://osf.io/5yj89/?view_only=3f9d7312371c4ebcb9a92a893e2e6cb5).

**STUDY 1**

The goal of Study 1 was to test the effect of performance incentives on social intentions. We predicted that participants who expected to be paid for their performance would be more motivated to prioritize relationship partners who were more relevant to the incentivized task (i.e., work ties) than those who were not (i.e., personal ties) as compared to participants who expected to be paid for their participation (Hypothesis 1). We also predicted that participants in a performance-incentive condition would perceive their work ties to be more instrumental than those in a participation-incentive (control) condition and that perceived instrumentality would mediate the effect of performance incentives on the prioritization of work ties (Hypothesis 2 and 3).

**Participants**

We recruited four hundred and one participants ($M_{age} = 35.20$, 36% female) via Amazon.com’s Mechanical Turk (MTurk). All participants received $0.50 at the end of the study. We used G*Power 3 to calculate the sample size needed to detect a minimum effect of $r = .21$ with 80% power (Cohen, 1992) and recruited 200 participants per condition based on recent research suggesting that correlations stabilize around 200 participants (Schönbrodt & Perugini, 2013). We retained all participants for analysis as indicated in our pre-registration. The sample demographics and summary statistics for each study are fully described in in SOM (Table S1).

**Procedure**

We randomly assigned participants to one of two conditions (performance-incentive vs.
participation-incentive) in a between-subjects design. Participants imagined that they were employed at a marketing company where they worked on projects developing various marketing strategies. At the end of each project, a performance assessment took place where participants would be evaluated on their performance by their peers, managers, and clients.

Participants were then told how they would be rewarded. In the performance-incentive condition \((n = 198)\), participants were told that they would receive monetary rewards based on their performance on top of their base salary. In the participation-incentive condition \((n = 203)\), participants were told that they would receive a fixed amount of pay for their participation regardless of their performance. We employed participation-contingent incentives (e.g., fixed salaries) as our control condition, following a number of prior studies that have compared the effects of different incentive systems while holding the task and reward constant (Bailey, Brown, & Cocco, 1998; Braun, Kirsch, & Yamamoto, 2011; Cadsby, Song, & Tapon, 2007; Hur & Nordgren, 2016). We told participants in both conditions that the expected amount of reward for each project would be $3,000 on average. This design allowed us to provide participants with an identical task and reward amount, while only differing the way that the reward was earned.

After reading about each incentive system, participants rated perceived instrumentality of work relationships with five items from 1 = Strongly Disagree to 7 = Strongly Agree \((\alpha = .92)\; \text{e.g.,} \; “\text{My colleagues would be useful for me to achieve my goal of making more money}”; adapted from Gruenfeld et al., 2008). Participants also indicated their willingness to prioritize work relationships over non-work, personal relationships with four items \((\alpha = .93)\; \text{e.g.,} \; “\text{On occasion, I would prioritize spending time with colleagues over socializing with friends and family,” “I would try not to miss opportunities to socialize with colleagues outside of work, even when I miss opportunities to socialize with friends and family.”}). We took the average of each
scale to create composite measures of perceived instrumentality and prioritization of work ties. Lastly, participants provided demographic information and were debriefed about the purpose of the study. The exact instructions and items for Study 1 are described in Appendix A.

Results

Prioritization of work ties. First, we analyzed participants’ willingness to prioritize work ties over non-work, personal ties. As predicted, a simple t-test yielded a main effect of the incentive-system manipulation: participants who were randomly assigned to the performance-incentive condition indicated greater willingness to prioritize socializing with work ties to personal ties ($M = 5.15$, $SD = 1.06$) than those in the participation-incentive condition ($M = 3.88$, $SD = 1.76$), $t (399) = -8.696$, $p < .001$, 95% CI [-1.553, -0.981], $d = 0.874$. This result supports our prediction that performance incentives increase the extent to which individuals prioritize socializing with task-relevant, work ties as opposed to non-task relevant, personal ties.

Perceived instrumentality. Next, we analyzed participants’ perception of the instrumentality of their work ties. A simple t-test on the instrumentality measure yielded a main effect of the incentive-system manipulation: participants in the performance-incentive condition perceived their work relationships as more instrumental for the goal of making money ($M = 6.02$, $SD = 0.80$) than those in the participation-incentive condition ($M = 4.38$, $SD = 1.62$), $t (399) = -12.781$, $p < .001$, 95% CI [-1.891, -1.386], $d = 1.284$. This result supports our prediction that performance incentives increase the perceived instrumentality of work ties.

Mediation. Lastly, we conducted a mediation analysis using the PROCESS Mediation Model 4 (Hayes 2013; Preacher and Hayes, 2004) with incentive system as the independent variable (1 = performance incentive, -1 = participation incentive), perceived instrumentality as the mediating variable, and willingness to prioritize work ties as the dependent variable. The
total effect of performance incentives on willingness to prioritize work ties was significant, $b = 1.267, p < .001$, 95% CI [0.981, 1.553]. The mean indirect effects excluded zero for perceived instrumentality, $b = 1.209$, 95% CI [0.975, 1.436], and the direct effect of performance incentives on willingness to prioritize work ties was not significant, $b = 0.058, p = 0.658$, 95% CI [-0.201, 0.317]. These results suggest that perceived instrumentality mediated the observed results (Figure 1).

**Figure 1**
Study 1 Mediation Analysis.

![Diagram showing mediation analysis](Image)

*Note.* *p* < .05, **p** < .01, ***p*** < .001

**Discussion**

The results of Study 1 support our central prediction: exposure to performance incentives led participants to prioritize socializing with work ties over non-work, personal ties. The results also provided evidence for the proposed mechanism: performance incentives increased the perceived instrumentality of work ties, which increased willingness to prioritize work ties over personal ties. In Study 1, participants were told that their performance was determined by peer, manager, and client evaluations. An open question is whether performance measurement plays a role in the effect of performance incentives on the prioritization of work ties. In Study 2, instead of peer evaluation, we varied the degree to which incentives were determined by *collaboration.*
Employees might find their work ties instrumental for a variety of reasons. For example, one can benefit from peers by exchanging tacit knowledge (Politis, 2003), receiving advice (Zagenczyk & Murrell, 2009), and communicating efficiently (Kashyap, 2019). In our conceptualization, any work structure that increases the instrumentality of work ties should amplify the effect of performance incentives: the more that work colleagues are “useful” for maximizing incentives, the more that people should prioritize them over personal ties. Therefore, while participants in Study 1 depended on their peers to maximize incentives via evaluation, we used collaboration in Study 2 as a means to create dependence on peers to maximize incentives. We also manipulated the level of instrumentality (instead of measuring it as in Study 1) by varying the level of collaboration. Our effects should be stronger in any context where there is higher dependence on peers to secure monetary rewards – via evaluation or collaboration.

**STUDY 2**

The goal of Study 2 was to replicate the results observed in Study 1, to examine the role of collaboration, and to directly manipulate instrumentality as opposed to measuring it. We predicted an interaction, such that the effects of performance incentives on prioritization of work ties would be moderated by the degree of collaboration needed to earn more money.

**Participants**

We recruited eight hundred and one participants ($M_{\text{age}} = 37.54$, 40% female) via Amazon.com’s Mechanical Turk (MTurk). All participants received $0.70. We used the same logic as in Study 1 to calculate our sample size for detecting a minimum effect of $r = 0.21$ with 80% power.

**Procedure**

We randomly assigned participants to one of four conditions in a 2 (incentive-system:
performance vs. participation) × 2 (collaboration: high vs. low) between-subjects factorial design. Using a similar paradigm as Study 1, participants first imagined that they worked in a marketing company where they would receive a performance assessment about how well they performed on each project. We experimentally manipulated the perceived instrumentality of work ties by varying a degree of collaboration needed at their workplace.

In the high-collaboration condition \((n = 396)\), participants were told that 90% of their tasks would come from teamwork, while 10% would come from individual work. In contrast, in the low-collaboration condition \((n = 405)\), participants were told that 90% of their tasks would come from individual work, while 10% would come from work teamwork. We then informed participants whether or not their monetary rewards would be contingent on their performance.

In the performance-incentive condition \((n = 401)\), we told participants that they would receive monetary rewards based on their performance, which made up half of their overall pay.\(^1\) In the participation-incentive condition \((n = 400)\), we told participants that they would receive a fixed amount of money regardless of performance. We told participants in all four conditions that, on average, the expected amount of payment for each project would be about $3,000.\(^2\)

As a manipulation check, participants rated the perceived instrumentality of work ties with the five items from Study 1 \((\alpha = 0.79; \text{ e.g., } \text{“My relationship with my team members would be useful for me to achieve my goal of making more money”})\). Then, participants indicated their willingness to prioritize work ties over non-work personal ties using the four items from Study 1 \((\alpha = .85; \text{ e.g., } \text{“On occasion, I would prioritize spending time with the team members over}}

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\(^1\) We set our scenario for performance incentives at 50% because this is a common rate in which performance incentives make up employees' total pay (Lucero, 2019).

\(^2\) We also asked participants to indicate how much they expected to earn per project. We confirmed that the expected reward amount did not significantly vary between the performance \((M = 7.08, SD = 2.08)\) and fixed conditions \((M = 7.01, SD = 2.28)\), \(t(799) = 0.452, p < 0.652\).
socializing with friends and family”), which served as our key dependent variable. Participants then provided demographic information. See Appendix B for the exact instructions and items.

Results

_Manipulation check._ The *t*-test analysis confirmed that our manipulation was successful: participants in the performance-incentive condition (*M* = 5.50, *SD* = 1.24) perceived their work ties as more instrumental for making money than those in the participation-incentive condition (*M* = 4.59, *SD* = 1.77), *t*(799) = -8.361, *p* < .001, 95% CI [-0.111, 0.690], *d* = 0.755. Additionally, participants in the high-collaboration condition (*M* = 5.35, *SD* = 1.43) perceived work ties as more instrumental than those in the low-collaboration condition, (*M* = 4.75, *SD* = 1.69), *t*(799) = -5.427, *p* < .001, 95% CI [-0.817, 0.383], *d* = 0.383.

_Prioritization of work ties._ We conducted a 2 (incentive) × 2 (collaboration) ANOVA to analyze participants’ willingness to prioritize work ties over personal ties. Confirming our hypotheses, the predicted interaction was significant, indicating that the level of collaboration moderated the effect of incentive systems on participants’ willingness to prioritize socializing with work ties over personal ties, *F*(3,797) = 6.577, *MSE* = 19.316, *p* < .001, η² = 0.037.

Decomposing this interaction, when work tasks involved a high level of collaboration, participants in the performance-incentive condition (*M* = 5.06, *SD* = 1.17) were significantly more likely to prioritize work ties over personal ties as compared to those in the participation-incentive condition (*M* = 4.38, *SD* = 1.83), *F*(1,797) = 15.568, *MSE* = 45.725, *p* < .001, η² = 0.019. In contrast, among participants whose tasks involved a low level of collaboration, there was no difference on willingness to prioritize work ties between the two incentive conditions (*M*<sub>Performance</sub> = 4.27, *SD*<sub>Performance</sub> = 1.84; *M*<sub>Participation</sub> = 4.22, *SD*<sub>Participation</sub> = 1.90, *F*(1,797) = 0.118, *MSE* = 0.346, *p* = 0.737, η² < .001. See Figure 2 for a visualization of the results.
Discussion

Study 2 provides additional support for the perceived instrumentality account. The effect of performance incentives on willingness to prioritize work ties was moderated by the degree to which participants' work tasks involved collaboration. These results show that the effect of performance incentives on social interactions with work ties depends critically on whether peers are necessary for reaping financial rewards. Studies 1 and 2 examined to what extent participants said they would prioritize their work ties. A remaining question is whether we would observe the same effect with an actual decision-making measure, which could be less subject to social desirability concerns (Girard & Cohn, 2016; Hur, Ruttan, & Shea, 2020; Whillans, Weidman, & Dunn, 2016). Thus, in Study 3, we asked participants to allocate the amount of time that they would spend interacting with other participants in preparation for an upcoming task.

STUDY 3
The main goal of Study 3 was to replicate the results that we observed in Studies 1 and 2 with a decision-making measure. Participants were told that they would work on a collaborative task with other participants as a team. Prior to working on the task, participants allocated the number of minutes they would spend interacting with team members. We predicted that participants who expected to receive incentives for performance would allocate more time to interacting with team members than those who expected to receive incentives for participation. We also explored differences in the content of social interactions. We examined whether participants in the performance-incentive condition allocated more time with team members on goal-relevant issues (i.e., task related) than those in the participation-incentive condition.

**Participants**

To test these predictions, we recruited four hundred participants (M\text{age} = 19.59, 38\% female) online via Amazon.com’s Mechanical Turk (MTurk). All participants received $1.50 for their participation. We determined the sample size to provide adequate power (1 – β > .80) to detect a medium effect (f^2 = 0.15). We ended up with 347 participants after excluding participants who failed attention checks following our pre-registered exclusion criteria. Results remained the same looking at the full sample.\(^3\)

**Procedure**

Participants were randomly assigned to one of two conditions: performance incentives or participation incentives. Participants were first told that they would work on a computerized 3D Lego puzzle task and were shown several images of Lego models as examples. Participants were

\(^3\) Results also remained the same in Studies 1 and 2 after excluding participants who failed attention checks. We did not pre-register to exclude people who failed manipulation checks in Studies 1 and 2 but did so in Study 3 due to the more complex instructions provided to participants. Thus, all studies followed the pre-registered exclusion criteria.
then told that they would be grouped with other workers on MTurk as a team and work on the task together, interacting through an online chat platform called ChatPlat.

We told participants that the task would be divided into an observation period and a construction period. The observation period would require participants to prepare how to memorize the provided Lego model and plan how to put the pieces together. The construction period would require participants to put the Lego pieces together to build the model as accurately as possible. There would be five puzzles to solve in total (i.e., five Lego models). Participants were told that effective team communication would help them succeed at their task.

Participants in the performance-incentive condition read that they would receive a bonus based on the number of puzzles their team solved. Each puzzle task was worth a bonus of $0.10 and participants could earn up to $0.50 if they solved all five puzzles correctly. In contrast, participants in the participation-incentive condition read that their pay would not be contingent on performance and that they would receive a fixed bonus amount regardless of the number of puzzles that their team solved ($0.50). Participants in both conditions planned to work on the same task and expected to receive the same number of potential rewards, but the incentive system for receiving the rewards differed between the two conditions (Hur & Nordgren, 2016).

After reading the task instructions, participants were told that they had a 5-minute pre-work session and that they were responsible for deciding how their team would spend this time. Participants could allocate the amount of time that they wanted to spend alone or to spend interacting with team members online. Participants had to allocate the five minutes of time to four different activities: interacting with team members on task-related matters, interacting with team members on non-task related matters, preparing for the task alone, and neither preparing for
the task alone nor interacting with team members. These items served as our key dependent variables.\textsuperscript{4} The exact task instructions and items are described in Appendix C.

Results

Social interaction decisions. We first examined the main effect of performance incentives on the time that participants decided to spend interacting with team members. A \( t \)-test yielded a significant main effect of the incentive-system manipulation such that participants in the performance incentive condition (\( M = 2.00 \text{ min}, SD = 1.49 \)) spent more minutes with team members on task-related matters than in the participation incentive condition (\( M = 1.62 \text{ min}, SD = 1.32 \)), \( t(345) = -2.475, p = 0.014, 95\% \text{ CI} [-0.677, -0.077], d = 0.270 \). This result held when we used a log-transformed outcome measure to account for non-normality. This result fits with our prediction that performance incentives increase time spent on instrumental relationships.

Participants in the performance incentive condition (\( M = 0.56, SD = 0.76 \)) decided to spend marginally fewer minutes with team members on non-task related matters than in the participation incentive condition (\( M = 0.72, SD = 0.78 \)), \( t(345) = 1.968, p = 0.050, 95\% \text{ CI} [0.0001, 0.325], d = 0.21 \). Participants did not differ in the amount of time that they decided to spend alone preparing for the task (\( M_{\text{performance}} = 1.97, SD = 1.65; M_{\text{participation}} = 2.18, SD = 1.62 \)), \( t(345) = 1.253, p = 0.211, 95\% \text{ CI} [-0.126, 0.566], d = 0.208 \) or relaxing before completing the task (\( M_{\text{performance}} = 0.48, SD = 0.98; M_{\text{participation}} = 0.48, SD = 0.97 \)), \( t(345) = -0.055, p = 0.956, 95\% \text{ CI} [-0.213, 0.201], d < .001 \). Given that there were no difference in the time allocated

\textsuperscript{4} We told participants that they would work on the task, but they did not, following a widely-used practice to capture decision-making (e.g., Hur, Ruttan, & Shea, 2020). Participants did not work on the puzzle task; however, They were led to believe that they were actually going to complete the task. After debriefing, we asked participants whether the instruction of completing the computerized puzzle task with other participants was believable. 92\% of participants answered that it was believable. All of our results held with and without the inclusion of the 8\% of participants who answered that they did not believe they would work on the puzzle task.
toward relaxing without working on the task between the two conditions, we believe that participants in the two conditions intended to invest relatively similar levels of effort.

Discussion

Study 3 replicated our previous results with a decision-based measure: the number of minutes that participants allocated toward interacting with team members. Moreover, exploratory analyses indicated that participants in a performance incentive system decided to spend more time with team members on task-related matters as compared to those in a participation incentive system, who decided to spend more time with team members on non-task related matters. These results provide further support for our instrumentality account. When people are working under performance incentives, they decide to spend more time with colleagues who are instrumental for money-making goal and to discuss issues that are instrumental for these goals.

In Studies 1 – 3, we directly manipulated the level of performance contingency – whether individuals were rewarded for their performance or were not. It therefore remains unclear whether the effect of performance incentives exists only in the immediate moment, when one’s incentive system is made salient at the moment of decision-making. In Study 4, we examined whether participants who received performance incentives at their primary job were more likely to choose spending time with their work ties instead of socializing with their personal ties. Moreover, we tested the effect of performance incentives on the direct trade-off between work ties and personal ties by setting the two type of social ties against each other. Specifically, we administered scenarios that contained realistic dilemmas in which participants had to choose to spend time with either their work ties or personal ties. For example, respondents answered questions like: Would you go to a happy hour with colleagues or go to your friend's birthday party instead? Would you go to a networking event or go to your child's piano recital instead?
STUDY 4

The goal of Study 4 was to replicate the previous results by measuring respondents’ incentive systems and employing explicit trade-off dilemmas that involved choosing between work ties and personal ties. We predicted that respondents who received performance incentives (vs. fixed salaries) at work would be more likely to choose to spend time with their work relationships over their personal relationships across various trade-off scenarios.

To create common real-world dilemmas, we conducted a pilot study with 595 working adults recruited from Amazon’s Mechanical Turk ($M_{age} = 37.61$, 36% female). Respondents wrote about a time where they had to choose between work- and personal relationships. Some of the most common dilemmas included deciding whether to eat meals with coworkers or with family members (e.g., "I had to decide whether to go to happy hour with my new co-workers, or to go out to dinner with my parents."), whether to attend social events with coworkers or with friends (e.g., "There was an office party for the holidays and everyone was expected to go. It was also a prime night to stay with friends for the holidays."), or whether to attend work-related meetings or family gatherings (e.g., "Last year I was working on a very important project as a team leader. I was in charge of recruiting the members as well as presenting the final proposal. The date of the final proposal clashed with my 20th wedding anniversary.").

We created five scenarios based on the most common dilemmas that we observed. Across these scenarios, we predicted that respondents working in a performance incentive system would be more likely to choose to spend time with their work ties at the sacrifice of spending time with personal ties than respondents who were working in a participation incentive system. The exact instructions for the pilot study can be found in Appendix D, and the complete list of dilemmas and items used in the main study can be found in Appendix E.
Participants

We aimed to recruit two hundred full-time employees per group (performance incentives vs. participation incentive) via MTurk (Schönbrodt & Perugini, 2013). We ended up with 545 respondents (M_{age} = 36.67, 41% female, 40% performance-incentives). As per our pre-registered analysis plan, we did not exclude any respondents. The results were statistically consistent regardless of whether or not we included people who failed the manipulation checks.

Procedure

Respondents first read the five dilemma scenarios and made a choice between spending time with work ties versus personal ties (e.g., "Imagine that you’ve recently been hired at a new company. Your immediate supervisor asks if you would like to attend a workshop event together if you have no plans on Friday. However, you also have your friend’s surprise birthday party on Friday. Would you attend the workshop with your supervisor or your friend’s birthday party?"). Respondents received a score of 1 each time they chose work over personal ties. We summed the scores such that respondents received an overall score from 0 to 5. A higher score indicated that respondents were more likely to choose to spend time with work ties at the sacrifice of personal ties (M = 1.86, SD = 1.25). This measure was our key dependent variable.

Respondents then answered questions about their current job. Most importantly, they reported on whether they received performance incentives (1 = performance incentives) or fixed salaries (0 = participation incentives) at work. Respondents also reported on the extent to which performance affected pay ("To what extent do you believe your performance affects your pay?") on a scale from 1 = Not at All, to 7 = Very Much. We asked the performance-incentive questions after our dependent measure to rule out potential order effects (Krosnick & Alwin, 1987).
All respondents answered standard questions that we used as control variables including age, gender, number of children, marital status, education, family income, occupation type, work hours, tenure, and hourly pay (Pai, DeVoe, & Pfeffer, 2020). We also measured and controlled for respondents’ subjective social status using the McArthur Scale of Subjective Social Status (Adler et al., 2000), perceived money scarcity (adapted from Roux, Goldsmith, & Bonezzi, 2015; e.g., "I don’t have enough money"), and social desirability (adapted from Reynolds, 1982; e.g., "Are you always willing to admit when you make a mistake?").

Results

**Relationship trade-offs.** We conducted an OLS regression to examine whether respondents who reported receiving performance-based incentives were more likely to prioritize work vs. social activities. Confirming our central hypothesis, respondents who received performance incentives more frequently chose to spend time with work ties at the sacrifice of spending time with personal ties (M = 2.25; SD = 1.29) compared to respondents who received participation incentives (M = 1.29; SD 1.00), $b = 0.965$, $SE = 0.101$, $p < .001$, $d = 0.09$. These results held controlling for our pre-registered set of personal and work-related demographic covariates, $b = 0.622$, $SE = 0.112$, $p < .001$, $d = 0.19$. See Table 1 for detailed results.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Study 4 respondents' choice between work vs. personal ties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>(1)</td>
</tr>
<tr>
<td>PFP (1 = yes)</td>
<td>0.97***</td>
</tr>
<tr>
<td></td>
<td>(.10)</td>
</tr>
<tr>
<td>Age</td>
<td>-.01*</td>
</tr>
<tr>
<td>Gender (1 = female)</td>
<td>.14</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.02</td>
</tr>
<tr>
<td>Education</td>
<td>.19***</td>
</tr>
</tbody>
</table>


Marital status (1 = married) .25 (.05)
Income .001*** (.001)
Household size -.13* (.06)
Number of children .20** (.07)
Work hours (log) -.01*** (.003)
Hourly status -.21* (.11)
Occupation dummy YES
Social desirability .02 (.17)
Perceived money scarcity .08* (.04)

F Statistic

\( F(1,544) = 91.40 \)  \( F(24,489) = 7.57 \)

p-value .001 .001
R\(^2\) .14 .27

Note. * p < .05, ** p < .01, *** p < .001.

On an exploratory basis, we examined the effect of the continuous performance variable ("To what extent do you believe your performance affects your pay?" 1 = Not at All, 7 = Very Much) on the prioritization of work vs. social activities. Consistent with our primary pre-registered analysis with the binary measure, higher ratings predicted a greater likelihood of respondents choosing to spend time with work ties vs. personal ties, \( b = 0.164, SE = 0.029, p < .001 \). Results held controlling for the covariates, \( b = 0.077, SE = 0.029, p = 0.010 \).^5

Discussion

---

^5 On an exploratory basis, we also examined whether there was an interaction between SES and performance incentives on the trade-offs that participants made. The interaction was not significant for subjective SES, \( b = 0.085, SE = 0.053, p = 0.111 \) or for objective SES (education and income), \( b = -0.052, SE = 0.072, p = 0.474 \).
Taken together, when work- and personal-ties were directly compared against each other, people who worked in a performance incentive system were more likely to socialize with work colleagues even if it meant sacrificing spending time with friends and family. These results indicate that employees who receive performance incentive are more likely to prioritize work ties over personal ties than those who receive fixed salaries, even when their incentive systems are not made salient at the moment of decision-making. In Study 5, we further expanded on these findings by exploring actual time spent on social interactions outside the lab.

**STUDY 5**

The main purpose of Study 5 was to test the relationship between performance incentives and time spent on daily social interactions with work and personal ties outside of the lab. We used a large-scale, publicly available data set to examine whether exposure to performance incentives shaped social interactions. Following Studies 1 – 4, we predicted that people who were paid for their performance would engage in significantly more interactions with work colleagues and fewer interactions with friends and family as compared to people who were not.

Another objective of Study 5 was to explore the downstream consequences of interacting with work versus personal ties for subjective well-being. It is possible that employees who receive performance incentives spend more time with coworkers because they enjoy these interactions more, given that these interactions help these employees achieve their reward-seeking goals (Fonner, 2015). However, based on abundant evidence showing that socializing with personal ties can boost happiness (e.g., Diener & Seligman, 2002), it is also possible that employees derive more happiness from interactions with friends and family, regardless of the incentive system that they are exposed to. We explored these competing possibilities.

**Sample**
We analyzed data from the 2010-2015 waves of the American Time Use Survey (ATUS; Hofferth, Flood & Sobek, 2013). The ATUS is administered by the U.S. Census Bureau, which selects a large and diverse set of U.S. households from the Current Population Survey (CPS) and approximates a nationally representative sample (U.S. Bureau of Labor Statistics, 2014). The ATUS surveys a significant proportion of households with Black and Hispanic members, as well as households with children. It is the only existing federal survey that provides data on a large range of non-economic activities, from hobbies to social interactions. Full information about the survey is available at http://bls.gov/tus/home.htm.

We used the 2010-2015 waves because these waves contained our key variables of interest: incentive systems, type of social relationships, and time spent socializing with each type of relationship in the past 24 hours. Respondents were included if they had data for all the key variables. The sample consisted of 129,809 respondents ($M_{age} = 44.27$, 56% female) from diverse industries, such as professional (26%), sales (14%), service (9%), and production (7%).

**Method**

**Incentive system.** Respondents reported whether they received performance incentives (e.g., commissions, bonus) or whether they received participation incentives (e.g., fixed salaries). Consistent with previous research on this topic (Hur & Nordgren, 2016), we dummy coded incentive system (1 = performance-incentive; 0 = participation-incentive) as the independent variable. Within our sample, 17,887 respondents were paid with performance incentives and 111,922 were paid with participation incentives. Respondents who received performance incentives were more likely to be male (59%) and to live with a married spouse (52%) than those who received participation incentives. They also lived with fewer members in the household ($M = 2.81$) than respondents who received participation incentives ($M = 2.91$), as shown in Table 1.
**Time spent on social interactions.** Our main variable of interest was the amount of time that respondents spent socializing with work ties versus non-work, personal ties i.e., friends and family. These data were collected during 15 to 20-minute phone interviews. During these interviews, respondents reconstructed what they did on the previous day, episode by episode, as per the original Day Reconstruction Method (DRM; Kahneman et al., 2004). Respondents reconstructed a detailed account of all of their activities, starting at 4 a.m. the previous day and ending at 4 a.m. on the day of the interview. They described the activities in their own words, and these activities were later coded by at least two independent coders based on a broad range of activity categories. These descriptions included how long respondents spent on each activity, who accompanied them, and where the activity took place.

The open-ended nature of this method is considered the ‘gold-standard’ of time-use data collection because the time diary consists of a simple record of all activities that took place during the day and therefore provides minimal opportunity for respondents to distort their activities (e.g., reporting more hours of work to portray themselves as a hard worker). To distort one activity, respondents would have to fabricate all other activities. Thus, the ATUS captures an accurate picture of people’s entire day by collecting self-reports in an open-ended fashion on an activity-by-activity basis (see Giurge, Whillans & West, 2020 for a review). This technique also preserves the "zero-sum" property of time, allowing us to examine trade-offs between engaging in one activity vs. another (i.e., increases in one activity resulting in decreases in another).

We focused on the time that respondents spent in the last 24 hours socializing with work ties (i.e., colleagues) vs. the time they spent socializing with non-work, personal ties (i.e., friends and family). The time-use variables included a number of outliers, resulting in highly right-skewed distributions. To normalize the distributions, we took the square root of each variable.
PERFORMANCE INCENTIVES

This is consistent with prior work on time-use (Bianchi & Vohs, 2016; Whillans & Dunn, 2018). Our main dependent variable represented prioritization of work over personal ties, which was the number of minutes spent with work colleagues divided by number of minutes spent with family and friends per day, multiplied by 100. This represents the percentage of time spent with work ties proportionate to the time spent with personal ties.

The variables that involved time spent with each type of social ties (colleagues, friends, and family) were constructed by ATUS, following the categorization that respondents provided. Respondents were asked, "who was in the room with you? Who accompanied you?" and answered from a list of relationship categories (see Appendix G). Respondents defined their work relationships (colleagues) and non-work, personal relationships (friends and family), and their responses were categorized into two groups, allowing for a clear test of our hypotheses.

**Happiness.** The ATUS measures emotions that respondents experienced during daily activities. A computerized system randomly chooses three time-intervals from respondents' reconstructed day and reminds them of the activity they were engaging during the time. Respondents then rate how they felt engaging in the activity on a 7-point scale (1=Not at all, 7=Extremely). On an exploratory basis, we examined the effects of performance incentives on happiness via their influence on social interactions—given that social interactions are a critical predictor of momentary and daily happiness (Mogilner, Whillans & Norton, 2018).

**Control variables.** Following previous research on time use (Mogilner, 2010), we controlled for demographic and employment information including respondents’ gender, age, income, relationship status, household size, and work hours. We also included marital status and household size because these variables could affect time spent with personal relationships (Whillans et al., 2016). Due to the possibility that people who were paid for their performance
might spend more time with their coworkers simply because they work longer hours, we controlled for the amount of time worked in an average week. Consistent with related research using this data set (Bianchi & Vohs, 2016), we included two dummy coded variables that represented the survey year and day of week that respondents completed the survey.

Table 1
Study 5 Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance</th>
<th>Fixed</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.48 (12.16)</td>
<td>39.89 (12.97)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Female</td>
<td>40.7%</td>
<td>54.1%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Married spouse present</td>
<td>53.1%</td>
<td>54.7%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Household size</td>
<td>2.81 (1.47)</td>
<td>2.91 (1.48)</td>
<td>.065</td>
</tr>
<tr>
<td>Income</td>
<td>11.73 (3.39)</td>
<td>11.65 (3.59)</td>
<td>.003</td>
</tr>
<tr>
<td>Work hours</td>
<td>42.25 (10.52)</td>
<td>39.36 (11.24)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Note. N = 129809.
1This category represents $50,000-$59,999 USD per year of household income.

Results

Time spent on social interactions. First, we conducted an ordinary least squares (OLS) regression with incentive system as the independent variable and time spent interacting as the dependent variable. Consistent with our previous studies, respondents who received performance incentives spent proportionately more time socializing with work colleagues than with friends and family, $b = 2.436$, $SE = 0.183$, $p < .001$ (see model 1 of Table 2). This result held controlling for our full set of covariates, $b = 1.128$, $SE = 0.169$, $p < .001$ (see model 2 of Table 2) and when controlling for occupation, $b = 0.900$, $SE = 0.170$, $p < .001$, as shown in model 3 of Table 2.

Table 2
Study 5 regressions estimating prioritization of colleagues to family and friends
### Performance Incentives

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Incentive</td>
<td>2.44***</td>
<td>(.18)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>1.13***</td>
<td>(.17)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>0.90***</td>
<td>(.17)</td>
<td>.001</td>
</tr>
<tr>
<td>Age (log)</td>
<td>6.11***</td>
<td>(.52)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>5.78***</td>
<td>(.52)</td>
<td>.001</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.99***</td>
<td>(.13)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>-2.03***</td>
<td>(.14)</td>
<td>.001</td>
</tr>
<tr>
<td>Spouse Present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried Spouse</td>
<td>3.97***</td>
<td>(.31)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>3.97***</td>
<td>(.31)</td>
<td>.001</td>
</tr>
<tr>
<td>Married Spouse</td>
<td>-6.51***</td>
<td>(.17)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>-6.37***</td>
<td>(.17)</td>
<td>.001</td>
</tr>
<tr>
<td>Household size (log)</td>
<td>-14.03***</td>
<td>(.48)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>-14.54***</td>
<td>(.48)</td>
<td>.001</td>
</tr>
<tr>
<td>Income (log)</td>
<td>-2.80***</td>
<td>(.42)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>-1.69***</td>
<td>(.43)</td>
<td>.001</td>
</tr>
<tr>
<td>Work hours (log)</td>
<td>13.23***</td>
<td>(.43)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>13.57***</td>
<td>(.43)</td>
<td>.001</td>
</tr>
<tr>
<td>Hourly status</td>
<td>2.17***</td>
<td>(.23)</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>1.73***</td>
<td>(.14)</td>
<td>.001</td>
</tr>
<tr>
<td>Day of week dummy</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year dummy</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation dummy</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F Statistic**

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F(1,75210) = 177.07$</td>
<td>$F(20,62138) = 1483.34$</td>
<td>$F(26,62133) = 1208.34$</td>
</tr>
<tr>
<td>p-value</td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.33</td>
<td>.34</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, ***p < .001.

Significant decrease in degrees of freedom from model 1 to model 2 is due to missing data in the covariates and listwise deletion for respondents who had missing data for any one of the variables, including the dependent variable.

**Happiness.** Next, on an exploratory basis, we tested the effect of relationship type (work vs. personal) on happiness. Because respondents rated their emotions at three random time points, we conducted hierarchical regression analysis to account for non-independence. This analysis yielded the following results: Spending proportionately more time with work colleagues (vs. friends and family) was associated with lower happiness, $b = -0.007$, $SE = 0.001$, $p < .001$.

These results held controlling for our pre-registered set of covariates and occupation, $b = -0.006$, $SE = 0.001$, $p < .001$. In contrast, spending more time with family and friends over work...
colleagues was associated with greater happiness, \( b = 0.008, SE = 0.001, p < .001 \), controlling for the identical set of covariates, \( b = 0.006, SE = 0.001, p < .001 \). See Table S2 in SOM.

We then examined whether these results held for people who were paid with performance vs. participation incentives. Thus, we conducted the same regression analysis including the incentive system (1 = performance incentives; 0 = participation incentives) and the interaction term between relationship type and incentive system. The main effect held and there was no interaction between incentive system and social interactions. Interacting with friends and family more than with colleagues resulted in greater happiness, regardless of incentive system.\(^6\)

Lastly, we tested whether there was any direct effect of performance incentives on happiness. Performance incentives did not directly affect happiness, \( b = -0.012, SE = 0.015, p = 0.388, 95\% \text{ CI} [-0.016, 0.042] \). However, there was a significant indirect effect. To the extent that working under performance incentives encouraged people to spend more time with work colleagues and less time with friends and family, they reported lower happiness, \( b = -0.025, SE = 0.002, p < .001, 95\% \text{ CI} [-0.030, -0.021] \). These results held with our pre-registered set of covariates including occupation, \( b = -0.015, SE = 0.002, p < .001, 95\% \text{ CI} [-0.020, -0.010] \).

**Discussion**

Study 5 provides additional, ecologically valid support for the primary prediction that performance incentives influence employees’ social interactions not only within, but also outside organizations. In a large-scale, representative sample of U.S. working adults, people who were paid for their performance spent significantly more time interacting with work ties than with non-work, personal ties as compared to people who were not paid for their performance.

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\(^6\) We also conducted the same regression analysis with the level of stress participants reported from interacting with work vs. personal relationships, which showed the similar result. See full description of the results in SOM.
We also explored the affective responses of interacting with each type of relationship partner. Respondents in both performance-incentive and participation-incentive groups derived greater happiness from socializing with their friends and family (vs. colleagues). However, respondents who received performance incentives spent significantly more time with their colleagues and less time with their family and friends. These results suggest that, to the extent that performance incentives encourage people to prioritize work relationships over personal ones, performance incentives can undermine the happiness that people experience in their daily lives.

**GENERAL DISCUSSION**

Across five studies using different methods, populations, and measures, exposure to performance incentives had contrasting effects on social interactions with work and personal ties. In Studies 1 – 2, people who expected to work under performance incentives showed greater prioritization of work ties vs. personal ties. The effect of performance incentives on prioritization of work ties was partially driven by perceived instrumentality (Study 1) and moderated by task interdependence – the extent to which people were dependent on work colleagues to maximize their rewards (Study 2). In Study 3, we further replicated these effects using a time allocation decision measure for interactions tied to a specific task (Study 3). In Study 4, people working under performance incentives explicitly chose to socialize with work colleagues at the sacrifice of spending time with friends and family. Lastly, in Study 5, people who were subject to performance incentives invested more time in socializing with work colleagues in their daily lives, while simultaneously investing less time interacting with friends and family. People who worked under performance incentives, and socialized less with family and friends (vs. work ties) consequently experienced lower daily happiness.

**Theoretical Implications**
The current studies provide support for our hypothesis that incentive systems – a crucial part of modern educational, organizational, and healthcare structures – shape how people perceive and build social relationships. These findings are distinct from past research looking at how exposure to "money" itself can influence people's willingness to interact or help others (e.g., Pfeffer & DeVoe, 2009; Whillans & Dunn, 2015). Specifically, we provide the first empirical examination of whether and how exposure to a specific incentive system – how one earns money – affects day-to-day social interaction patterns. Research has primarily focused on the effects of performance incentives on social and prosocial motivation in general such as how a specific reward system shapes the degree to which someone is motivated to help others, regardless of who those individuals are (Ariely, Bracha, & Meier, 2009). The current work demonstrates that the same contextual factor, performance incentives, can have varying effects on social interactions depending on the usefulness of the relationship.

A great deal of data suggests that the quantity and quality of relationships with friends and family can have far reaching consequences for subjective well-being (Saphire-Bernstein & Taylor, 2013). Positive close relationships are associated with physical and psychological health (Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Spending time with friends and family is the happiest part of most people’s day (see Mogilner, Whillans, & Norton, 2018 for a review). However, people who are working under performance incentives spend significantly more time with their colleagues and less time with their family and friends. These results suggest that performance incentives might have long-term negative consequences for well-being by decreasing the amount of time spent with close relationships. Future research should explore this and related possibilities.
The current work contributes to an emerging literature that seeks to understand how organizational practices affect work-life balance (Goh, Pfeffer, & Zenios, 2015; Lockwood, 2003). Work-life balance is defined as a reflection of one's multiple life roles and of achieving a satisfying experience across these various roles (Greenhaus & Beutell, 1985). Most employees feel that the pendulum swings more toward the side of ‘work’ than ‘life’ (Kelly et al., 2015; Schieman, Milkie, & Glavin, 2009). Our findings suggest that a ubiquitous incentive system might contribute to a lack of work-life balance by encouraging employees to prioritize work ties over personal ties. A lack of work-life balance is particularly concerning when considering downstream consequences for organizational performance (Allen et al., 2000). Employees who experience greater work-life conflict report higher stress, lower job satisfaction, and greater turnover intentions (Anderson, Coffey, & Byerly, 2002; Ford, Heinen, & Langkamer, 2007).

Moreover, our results contribute to the literature on relationship formation. While prior research has traditionally conceptualized relationship formation as a function of similarity and proximity (McPherson, Smith-Lovin, & Cook, 2001; Nahemow & Lawton, 1975), an increasing body of research has examined the role of goal instrumentality in relationship formation and maintenance (Fitzsimons & Shah, 2008, Gruenfeld et al., 2008). The current findings add to this research by testing perceived instrumentality as a mechanism to explain how incentive systems affect the way individuals allocate their resources to different relationship partners.

**Limitations and Future Direction**

In exploratory analyses from Study 5, people who were paid for their performance derived significantly greater happiness from socializing with their friends and family, despite spending less time engaged in these social interactions on an average day. Similarly, individuals working under performance incentive systems might derive a lower level of satisfaction from
work relationships because these interactions may be construed as ‘strategic’ socializing (Casciaro, Gino, & Kouchaki, 2014) and undermine friendship formation. The current research focuses on the degree to which work relationships are instrumental for making more money, which does not necessarily capture quality of the relationship. Thus, future research should examine how performance incentives influence the perceived quality of social relationships by examining satisfaction or friendship formation among colleagues (Ingram & Zou, 2008).

Relatedly, another generative area for future research is to explore whether exposure to performance incentives prompts objectification of work colleagues. People are more likely to objectify others in work contexts as compared to non-work contexts because they are more likely to think strategically in the work contexts (Belmi & Schroeder, 2020). Building on this line of work, future research should explore whether performance incentives increase the tendency to objectify work colleagues by increasing perceived instrumentality. Future work on this topic could further illuminate aspects of work that shape how employees perceive each other.

Moreover, our dependent measures primarily focused on trade-offs between socializing with work ties vs. personal ties. Yet, people could make decisions to offset the time spent with coworkers with other non-socializing activities, such as exercising or sleeping less, to spend time equally with coworkers and family. While we looked at socializing as a zero-sum measure, which is consistent with a great deal of previous research (e.g., Kelly et al., 2015; Schieman et al., 2009; Whillans, et al., 2016), future research should explore the effect of performance incentives on the absolute amount of time people spend on social and other, non-social activities.

Future studies should also explore individual, occupational, or cultural differences that moderate the effect of performance incentives. For example, lower SES workers tend to find teamwork more enjoyable than higher SES workers (Dittmann et al., 2020). Although we did not
observe significant interactions between performance incentives and SES to predict the quantity of social interactions (Study 4), future research could explore whether low (vs. high) SES workers experience greater satisfaction with work ties while working under performance incentives. Also, the effect of performance incentives on prioritization of work ties may be stronger in the context of collectivist cultures where the norm of socializing with colleagues is stronger (e.g., Heinrichs et al., 2006) or in occupations where there is a greater need for teamwork (e.g., athletes, police). Future research should explore these possibilities.

Lastly, we focused on financial compensation because money is the most common reward at work and has been shown to have an especially powerful effect on behavior (Pessiglione et al., 2007; Vohs, 2015). However, it is possible to receive other non-monetary objects as performance-based rewards. For example, children can receive a pizza for finishing a book, college students can earn an iPad for winning a competition, and sales representatives can receive a car for having the best sales performance. Future research should therefore examine whether similar effects hold for other reward objects that individuals are striving toward.

**CONCLUSION**

Having positive relationships with close social ties can contribute to psychological and physical well-being. However, most working adults today feel that they are not spending enough time with their friends and family. The current research points to one potential cause of this phenomenon: performance incentives. We show that performance incentives—a ubiquitous reward system that is used in various domains like health, education, and organizations—can critically shape people's socialization patterns. Specifically, our research suggests that exposure to performance incentives alters the way that people think about and interact with different social
ties, leading them to find their work relationships as more instrumental and investing resources to build connections with them, even at the sacrifice of spending time with friends and family.
REFERENCES


APPENDIX A. Study 1 Instructions and Items

Instructions:
“Imagine you work in a marketing consulting firm. In this company, whenever you start a new project, you work with different team members and leaders (managers). The team then works together to develop marketing strategies for its clients. A project usually takes one to two months to finish. At the end of a project, the manager, clients, and other team members all evaluate your performance and contribution: how well you performed and how much you contributed to the team.”

Performance-incentive condition:
“This peer evaluation by managers, clients, and team members has a huge impact on your pay. You receive a big bonus for a good peer evaluation, on top of your base salary. This bonus usually makes up 50% of your pay.”

Participation-incentive condition:
“This peer evaluation by managers, clients, and team members, however, has no impact on your pay. You do not receive any bonus for a good peer evaluation. You receive a fixed amount of salary every month.”

Items:
Prioritization of work ties:
"On occasion, I would prioritize spending time with the team members over socializing with friends and family."
"I would feel a strong need to spend time with the team members, even at the sacrifice of time spent with friends and family."
"I would try not to miss opportunities to socialize with the team members at work, even when I miss opportunities to spend time with friends and family."
"I would try not to miss opportunities to socialize with the team members outside of work, even when I miss opportunities to socialize with friends and family."

Perceived instrumentality:
"To earn more money, how important would it be to have good relationships with your team members?"
"Considering all relationships in life, how important would the relationships with your team members be to earn more money?"
"The relationships with my team members would be important to me, because they would help me accomplish my goal of making money."
"My relationship with my team members would be useful for me to achieve my goal of making more money."
"My relationships with team members would be based on how productive our relationship is to earn more money rather than how much I enjoy our relationship."
APPENDIX B. Study 2 Instructions and Items

Instructions:

High-collaboration condition:
“Imagine you work in a marketing consulting firm. In this company, whenever you start a new project, you first conduct research about the client by yourself. Then, you work with your team members to develop marketing strategies for the clients. A project usually takes two months to finish. In each project, 90% of the tasks are done as a team, such as brainstorming together and sharing knowledge to build the team product, while only 10% of the tasks are done individually. This means that you mostly work with your team members and rarely work by yourself.”

Performance-incentive condition (High + Performance):
“Performance on each project has a HUGE impact on your pay. You receive a big bonus for developing a good product, on top of your base salary. This bonus usually makes up half of your pay for the project. In total, you earn about 3,000 dollars per project, on average.”

Participation-incentive condition (High + Participation):
“Performance on this project, however, has NO impact on your pay. You do not receive any bonus for developing a good product. You receive a fixed amount of salary at the end of the project. In total, you earn about 3,000 dollars per project, on average.”

Low-collaboration condition:
“Imagine you work in a marketing consulting firm. In this company, whenever you start a new project, you first conduct research about the client by yourself. Then, you work with your team members to develop marketing strategies for the clients. A project usually takes two months to finish. In each project, 90% of the tasks are done individually, such as studying client characteristics and conducting market research, while only 10% of the tasks are done as a team. This means that you mostly work by yourself and rarely work with your team members.”

Performance-incentive condition (Low + Performance):
“Performance on each project has a HUGE impact on your pay. You receive a big bonus for developing a good product, on top of your base salary. This bonus usually makes up half of your pay for the project. In total, you earn about 3,000 dollars per project, on average.”

Participation-incentive condition (Low + Participation):
“Performance on this project, however, has NO impact on your pay. You do not receive any bonus for developing a good product. You receive a fixed amount of salary at the end of the project. In total, you earn about 3,000 dollars per project, on average.”

Items:

Prioritization of work ties:
"On occasion, I would prioritize spending time with the team members over socializing with friends and family."
"I would feel a strong need to spend time with the team members, even at the sacrifice of time spent with friends and family."
"I would try not to miss opportunities to socialize with the team members at work, even when I miss opportunities to spend time with friends and family."
"I would try not to miss opportunities to socialize with the team members outside of work, even when I miss opportunities to socialize with friends and family."

*Perceived instrumentality:*
"To earn more money, how important would it be to have good relationships with your team members?"
"Considering all relationships in life, how important would the relationships with your team members be to earn more money?"
"The relationships with my team members would be important to me, because they would help me accomplish my goal of making money."
"My relationship with my team members would be useful for me to achieve my goal of making more money."
"My relationships with team members would be based on how productive our relationship is to earn more money rather than how much I enjoy our relationship."
APPENDIX C. Study 3 Instructions and Items

Instructions:
“Today, you will be working on a computerized task involving 3D Lego puzzles—we will call it the LegoMan task. You will work with 3D Lego pieces like below.”

“In the task, you are going to be grouped with other MTurk participants via an online chat—called Chatplat (https://www.chatplat.com/#/)—to work as a team. Your team's task is to solve the Lego puzzles exactly like the models we will provide.”

Performance-incentive condition:
“In each puzzle, you will see one finished Lego model and Lego pieces for the model. You will receive bonus for your team’s performance. You will receive $0.10 for each puzzle your team solves correctly. If you do not solve any puzzle, you will not receive any bonus. If you solve all the puzzles correctly, you will receive $0.50. Getting to know your team members will help you communicate better and it will help you earn more bonus.”

Participation-incentive condition:
“In each puzzle, you will see one finished Lego model and Lego pieces for the model. Again, you will not receive bonus for your team’s performance. You will receive bonus only for participation, regardless of the number of puzzles your team solves correctly. Everyone will receive the same amount of money, regardless of how well they do on the task. Getting to know your team members will help you communicate better but it will not help you earn more bonus.”

“Now, your team will have a pre-work session where you get to know the other members of your team and discuss the task (via online chat). Your role today is to plan how you will use this session. Please plan the session using the items below. The time you decide to spend on the pre-work session does not impact the amount of time you work on the LegoMan task.”

Items:
Time-allocation decision:
Please indicate how many minutes you would want to spend on each category you choose (please write 0 for any category that you do not want to spend any time on). You will have 5 minutes for the pre-work session and the minutes must add up to 5.

List of categories:
Interacting with team members on task related matters.
Interacting with team members on non-task related matters.
Preparing for the task alone.
Neither preparing for the task alone nor interacting with team members (e.g., relaxing).
Total
APPENDIX D. Study 4 Pilot Instructions

We often need to juggle many responsibilities in life including work, childcare, and personal commitments. A common dilemma that arises from this work-life strain is deciding whether to spend more time with colleagues at work or to spend more time on personal relationships. For example, on any given evening, you may have to decide whether to go to a happy hour with your coworkers or manager or to spend more time with your friends and family.

Please think about a time when you had to make a decision that involved this kind of relationship trade-off, a time when you had to choose between investing time in your work relationships or your personal relationships.

In the space below, please indicate what the trade-off was, what you decided, and how this made you feel.

Example: “I had to decide whether to attend my child’s piano recital or to attend a networking night with my colleagues. I decided to go to the networking night with my colleagues. I felt excited when I made new and important connections but also felt regretful about missing my child’s recital.”
APPENDIX E. Study 4 Measures

Dilemma Items

Imagine that you’ve recently been hired at a new company. Your immediate supervisor asks if you would like to attend a workshop event together if you have no plans on Friday. However, you also have your friend’s surprise birthday party on Friday. Would you attend the workshop with your supervisor or your friend’s birthday party?

I attend the:

a. Workshop with my supervisor
b. Friend’s birthday party

eyou get a message from your coworkers as you are packing up to leave work. They ask if you want to go out for dinner together and network with the board members tonight. As you are reading their message, your spouse also texts and asks if you would like to come home to have dinner and watch movies together. Whom would you spend the evening with?

I would spend the evening with...

c. Coworkers
d. Spouse

In the middle of a workday, your colleague stops by your office and asks if they can ask for your input on a new large scale project that your colleague is selling to a major client in an hour. You know that if you provide good input on the project, you might be able to find a role on the project which would be good for your career. However, you had already promised your partner that you would drive their mom to a doctor's appointment during this time.

I would:

a. Reschedule mom’s doctor’s appointment and attend the informal work meeting.
b. Take mom to the appointment and skip the informal work meeting.

On a Wednesday afternoon, your manager stops by your office and asks if you can join an important client call later that evening, with an overseas client. However, it is your night to pick up your son from daycare and make dinner. What would you do?

I would:

a. Attend the client call and ask your partner to pick up your son.
b. Tell your manager you can’t attend and pick up your son.

It's Friday evening and you were thinking of going home and having dinner with your parents. However, you also realized that you were planning to go to a bar with your colleagues for a department social event. Where would you go?
I would...

a. Go to the department social event with colleagues.
b. Go home and have dinner with parents.

**Independent variables**

[PFP] Do you receive any type of performance-based pay, in the form of commissions, bonuses, tips, or incentives?
b. No, I do not receive any performance-based pay.

[PFP] To what extent do you believe your performance affects your pay? (1 = not at all; 7 = very much)

**Control variables**

[Age] What is your age?

[Gender] What is your gender?
a. Female
b. Male
c. Binary/other

[Household member] How many people are living in your household?

[Children] How many children are living in your household?

[Marital status] What is your marital status?
a. Not married.
b. Married or in a marriage-like relationship.

[Income] What is your annual household income? Please write in numbers without symbols or commas.

[Money scarcity] Please indicate the extent to which you agree with the following statements on a scale from 1 = not at all, to 7 = very much.
Thinking about my life overall...
a. I don’t have enough money
b. My money is scarce
c. I need to protect the money I have
d. I need to acquire more money

[SES] Imagine that this ladder pictures how American society is set up. At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the
bottom are the people who are the worst off, those who have the least money, least education, worst jobs, or no job. Please indicate which rung best represents where you think you stand on the ladder.

[1 ~ 10 scale]

[Social desirability] Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is True or False as it pertains to you personally.

a. Have you sometimes taken unfair advantage of another person?
b. Are you always willing to admit when you make a mistake?
c. Do you sometimes feel resentful when you don’t get your own way?
d. Are you always courteous, even to people who are disagreeable?

[Occupation] What industry do you work in?

a. Management
b. Professional and related
c. Sales and office
d. Service
e. Construction and maintenance
f. Transportation and material moving
g. Self-employed
h. Unemployed
i. Other. Please describe.

[Hourly] Thinking about your main job, are you paid on a salary basis or an hourly basis?

a. On an hourly basis
b. On a salary basis
APPENDIX F. Study 5 ATUS Non-work Activities with Colleagues Categories

Socializing, relaxing, and leisure as part of job
- Attending social event w/coworkers (part of job)
- Attending social event w/bosses (part of job)
- Talking w/co-workers at social event (part of job)
- Talking w/clients at social event (part of job)

Eating and drinking as part of job
- Eating/drinking w/clients (part of job)
- Eating/drinking w/bosses (part of job)
- Eating/drinking w/customers (part of job)
- Having lunch/dinner w/clients (part of job)
- Eating/drinking w/coworkers (part of job)

Sports and exercise as part of job
- Playing golf w/clients (part of job)
- Attending sporting event w/boss (part of job)
- Working out w/clients (part of job)
APPENDIX H. Study 5 ATUS Relationship Categories

Full list of relationship categories answered from "who accompanied you?"

- 18 Alone
- 19 Alone
- 20 Spouse
- 21 Unmarried partner
- 22 Own household child
- 23 Grandchild
- 24 Parent
- 25 Brother/sister
- 26 Other related person
- 27 Foster child
- 28 Housemate/roommate
- 29 Roomer/boarder
- 30 Other nonrelative
- 40 Own nonhousehold child < 18
- 51 Parents (not living in household)
- 52 Other nonhousehold family members < 18
- 53 Other nonhousehold family members 18 and older (including parents-in-law)
- 54 Friends
- 56 Neighbors/acquaintances
- 57 Other nonhousehold children < 18
- 58 Other nonhousehold adults 18 and older
- 59 Boss or manager
- 60 People whom I supervise
- 61 Co-workers
- 62 Customers

Total work and non-work-related time spent with colleagues were measured using the following categories:

- 59 Boss or manager
- 60 People whom I supervise
- 61 Co-workers
- 62 Customers
Supplementary Online Materials

Table S1
Summary statistics across studies.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study 1 (N = 401)</th>
<th>Study 2 (N = 801)</th>
<th>Study 3 (N = 347)</th>
<th>Study 4 (N = 545)</th>
<th>Study 5 (N = 129809)</th>
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</thead>
<tbody>
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<td>% Performance incentives</td>
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<td>-</td>
<td>48.8%</td>
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<td>49.1%</td>
<td>-</td>
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<td>% Married Spouse Present</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>Household size</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Income</td>
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<td>4.51(^3)</td>
<td>1.75</td>
<td>6.33(^4)</td>
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<td>% Manager</td>
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<td>-</td>
</tr>
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<td>-</td>
<td>-</td>
<td>4.44(^6)</td>
</tr>
</tbody>
</table>

\(^1\)The age was measured with a bracket, using a 9-point scale (1 = "under 18", 9 = "85 or older"), and the mean age was calculated based on the mean value (3.52). We reported the standard deviation from the 9-point scale.

\(^2\)This category represents $50,000-$74,999 USD per year of household income.

\(^3\)This category represents $35,000-$49,999 USD per year of household income.

\(^4\)This category represents $50,000-$59,999 USD per year of household income.

\(^5\)This category represents $50,000-$59,999 USD per year of household income.

\(^6\)This category represents 20-30 hours.
### Table S2

Study 5 regression estimating respondents' happiness.

<table>
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<th>Variable</th>
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<td>(.001)</td>
<td>(.001)</td>
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<tr>
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<td>- .001</td>
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<td>(.001)</td>
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<td>.16*</td>
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<td><strong>F Statistic</strong></td>
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**Note.** * p < .05, ** p < .01, *** p < .001.

Degrees of freedom is lower in these models than in our main manuscript because the well-being questions were not answered by everyone in our main sample.
STUDY 5 ADDITIONAL ANALYSES ON STRESS

**Stress.** The regression analysis showed a similar pattern with stress, where respondents in both incentive systems reported greater stress when spending more time with colleagues, $b = 0.008, SE = 0.001, p < .001$, controlling for our full set of covariates, $b = 0.010, SE = 0.001, p < .001$. We further examined whether these results held for both incentive groups. Time with colleagues vs. family and friends once again predicted greater level of stress, $b = 0.009, SE = 0.001, p < .001$, but there was no significant interaction with incentive system, $b = -0.005, SE = 0.001, p = 0.226$. The interaction remained non-significant controlling for our set of covariates, $b = -0.001, SE = .001, p = .862$.

**Mediation.** We examined whether there was a direct effect of performance incentives on stress. We found a significant direct effect of performance incentives on stress, $b = -0.096, SE = .017, p < .001$, suggesting that people working under performance incentives reported lower stress. However, a significant indirect effect suggested that to the extent that people spent more time with work colleagues and less time socializing with friends and family, those working under performance incentives reported greater stress, $b = 0.019, SE = 0.002, 95\% CI [0.013, 0.024]$. 
Table S3

Study 5 regression estimating respondents’ stress.

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F Statistic: $F(1,50697) = 1320.66$  $p$-value = .001

$F(22,26175) = 113.70$  $p$-value = .001

$F(24,22120) = 95.94$  $p$-value = .001

$R^2 = .01$  $R^2 = .05$

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Degrees of freedom is lower in these models than in our main manuscript because the well-being questions were not answered by everyone in our main sample.
STUDY 5 ADDITIONAL ANALYSES ON WORK VS. NON-WORK ACTIVITIES

We also examined the amount of time that respondents spent on work-related and non-work-related activities. Respondents who received performance incentives spent more time with colleagues vs. friends and family on work-related activities, $b = 2.149$, $SE = 0.172$, $p < .001$, even controlling for our full set of covariates, $b = 1.007$, $SE = 0.160$, $p < .001$. Respondents who received performance incentives also spent more time with colleagues vs. friends and family on non-work-related activities, $b = 1.128$, $SE = 0.092$, $p < .001$, controlling for our full set of covariates, $b = 0.345$, $SE = 0.116$, $p < .001$.

STUDY 5 ADDITIONAL ANALYSES ON WEEKDAY VS. WEEKEND

We also examined whether there were any difference between weekdays (when people typically have less control over their time) and weekends (when people typically have more control over their time). Our results held for time spent on weekends, $b = 2.300$, $SE = 0.238$, $p < .001$, even after controlling for our full set of covariates, $b = 1.654$, $SE = 0.255$, $p < .001$. Our results also held on weekdays, $b = 1.342$, $SE = 0.228$, $p < .001$; however, when controlling for our full set of covariates, respondents who received performance incentives did not spend more time with colleagues vs. friends and family, $b = -0.177$, $SE = 0.235$, $p = 0.452$. This suggests that the observed effects of performance incentives are present outside of work-relevant contexts where employees’ typically have more control over their discretionary time (i.e., weekend).
Table S4
Study 5 sample size by variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>Performance incentive</td>
<td>129809</td>
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<tr>
<td>Hourly status</td>
<td>129809</td>
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<tr>
<td>Age</td>
<td>239072</td>
</tr>
<tr>
<td>Female</td>
<td>239072</td>
</tr>
<tr>
<td>Married spouse present</td>
<td>239072</td>
</tr>
<tr>
<td>Household size</td>
<td>239072</td>
</tr>
<tr>
<td>Occupation</td>
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<tr>
<td>Income</td>
<td>129916</td>
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<tr>
<td>Work hours</td>
<td>140779</td>
</tr>
<tr>
<td>Happiness (DV)</td>
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</tr>
<tr>
<td>Colleague Vs. Friends and Family</td>
<td>140295</td>
</tr>
</tbody>
</table>

Note. Valid N (listwise) = 62160.