The Effect of Tangible and Intangible Noncash Rewards on Performance and Satisfaction in a Production Setting

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Research has shown that the relationship between noncash rewards and employee motivation is complex. An experiment simulating a production environment examines the effect that noncash incentives might have on workers' performance and the interaction between various types of incentives. The results suggest that companies that already have cash incentives also may want to consider adding noncash rewards to their performance incentive systems.

In the current economic environment, cost-effective ways for managers to motivate employees are increasingly important for all types of organizations.[1] As managers look for ways to improve employee performance using rewards other than cash, they need to understand the implications of the type of alternative or additional incentive system they adopt. In this article, we will examine how noncash rewards interact with cash awards and affect a manager's ability to influence a worker's task performance and perceptions of task attractiveness, which is a dimension of job satisfaction.

Many organizations use noncash incentives—both tangible (i.e., a physical item the employee can hold and/or consume) and intangible (i.e., a statement of recognition)—to encourage employee effort and enhance morale. These rewards take many forms, such as employee-of-the-month rewards, celebrations of specific achievements, token gifts such as a mug or pen with the company logo, lunch with the boss, and simple recognition for a job well done. Although their use is widespread, academic research has focused primarily on the effectiveness of cash rewards.[2] A review of such research found 131 published studies that explored how

various forms of incentive schemes with cash rewards affect the task performance of their participants.[3] Some of that research shows that cash incentives are not always the best option to increase performance.[4]

We conducted an experiment that involves cash and noncash incentives and found that both types of incentives affect task performance and task satisfaction in a production setting. The nature of the relationship is complex and involves interactions among the types of incentives.

We will first review motivational theories, develop our hypotheses, and then present and discuss our results.

Theoretical Development

We begin by defining our construct of motivation in terms of standard agency theory. We then form our predictions based on agency theory and the complementary theories of self-determination and motivation crowding.

The standard agency model assumes that both principals (employers) and agents (employees) are utility maximizers.[5] The agent's utility increases as the wage increases and decreases as the level of effort increases. Specifically, the increase in the agent's expected utility caused by an increase in pay because of a cash-incentive scheme must be greater than the cost to the agent of the additional effort necessary to affect the likelihood of the performance outcomes that the principal desires. As long as the expected increase in utility because of higher compensation is greater than the expected decrease in utility because of higher effort, the agent is *motivated* to exert higher effort.

Once the marginal benefit to the agent of additional effort equals its marginal cost, the agent's motivation to work harder decreases to zero and effort levels off. From the perspective of the standard agency model, therefore, we expected noncash incentives to affect motivation and, therefore, effort in the same fashion as cash incentives. When the increased utility the agent expects from receiving the noncash reward is greater than the cost of any additional effort required to earn the reward, the noncash incentive will motivate the agent to increase effort.

In stark contrast to the assumptions of agency theory, there is substantial experimental evidence that external rewards decrease performance.[6] Two primary theories—self-determination theory (SDT) and motivation crowding theory—address the empirical evidence that extrinsic incentives *decrease* performance. SDT argues that two psychological characteristics affect an individual's level of motivation: a sense of autonomy at work and a sense of competence from working on a task. Incentives can affect these self-perceptions so that the expected utility from an incentive is reduced.[7] Noncash rewards, then, will affect motivation over and above cash incentives if they change an individual's perceptions of autonomy and/or competence.

An extension of cognitive evaluation theory (CET), SDT has continued to evolve over the past 20 years. CET addresses how rewards affect intrinsic motivation, positing that an individual values (gains utility from) an increased perception of competence and autonomy. That is, to be motivated to perform a task, an individual must feel (1) capable of performing the task and (2) that performing the task is by choice and not due to external controlling factors.

External contingencies such as rewards, feedback, and deadlines can reduce motivation if the individual perceives them as controlling. This perception of control reduces the individual's sense of autonomy and competence. Rewards, therefore, decrease the utility the individual expects from receiving the incentive, leading the individual to find it too costly to exert any additional effort.

Motivation crowding theory argues that extrinsic incentives may increase one form of motivation at the expense of another (presumably more powerful) form of motivation.[8] Motivation crowding theory suggests that external rewards or punishments may undermine intrinsic motivation—the individual's inherent desire to work hard and perform well—if the individual perceives the reward to be controlling. The theory describes conditions under which motivation is a zero-sum construct such that increased extrinsic motivation must decrease intrinsic motivation. These conditions typically involve tasks with a high degree of individual autonomy.

Predictions

Our primary interest is in how noncash incentives inter-

Figure 1: Experiment Design

	Tangible Noncash Incentive (University Logo Chocolate Bar)			
	N		Y	
	Intangible Noncash Incentive ("Best Performer" Plaque)		Intangible Noncash Incentive ("Best Performer" Plaque)	
WAGE	**N**	**Y**	**N**	**Y**
Fixed Wage	1	2	3	4
Fixed Wage Plus Piece-Rate Bonus	5	6	7	8

act with typical financial incentives to affect employee task performance and employee satisfaction with the task. Understanding the effect of noncash incentives on task performance is important so that employers can provide appropriate incentives.

We believe individuals will perceive noncash incentives to be less controlling than cash incentives. Consequently, the presence of a noncash incentive should improve both task performance and task attractiveness provided that the individual places enough value on receiving the noncash reward to compensate for the additional effort.

Hypothesis 1

Tangible noncash incentives will improve production-task performance and production-task attractiveness.

Hypothesis 2

Intangible noncash incentives will improve production-task performance and production-task attractiveness.

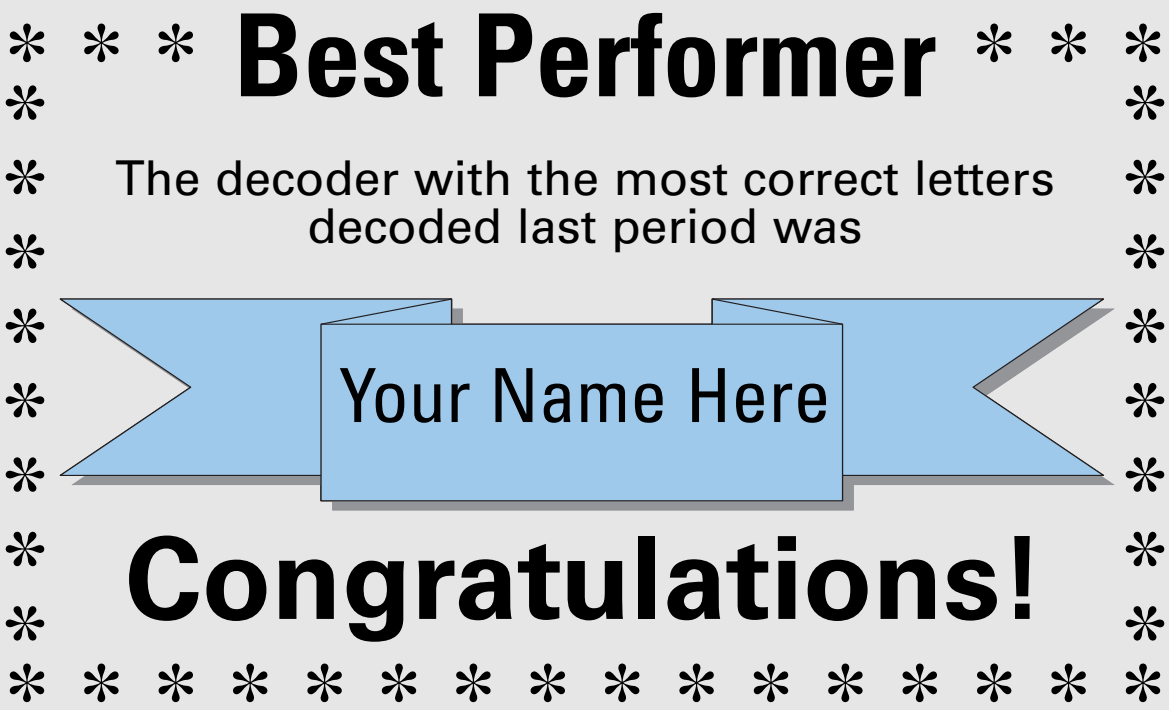
Methodology

Our participants performed a letter-decoding task that other researchers have used to explore incentive effects on budget negotiations, resource allocation, and information use.[9] They were part of a research pool because of their enrollment in an introductory accounting course at a large southeastern university.[10] Most participants were younger than 20 and in their first or second year of college. Because we were exploring the effects of incentives in a routine production-task setting for which no special training, knowledge, or expertise is required, this was an appropriate participant pool.

Figure 1 depicts our fully crossed $2 \times 2 \times 2$ experiment. We manipulated the rewards as follows: whether there was a cash incentive, whether there was an intangible noncash incentive, and whether there was a tangible noncash incentive. All participants received at least a fixed payment for each letter-decoding session.

Our dependent variables were task performance and perceived task attractiveness. We measured task performance as the average number of letters a participant decoded during the experiment's three production periods. We measured perceived task attractiveness as the participant's response to a post-experiment questionnaire assessing the extent to which the task was boring, exciting, interesting, tiring, and rewarding. The participant clicked on one of five ratings, anchored by "Strongly Disagree" (a rating of 1) at one end and "Strongly Agree" (a rating of 5) at the other. Our measure is the mean rating across the five adjectives. Because boring and tiring are negative perceptions, we reversed the coding (i.e., a score of 1 would be reverse-coded as a 5) for these adjectives when we calculated

Figure 2: **Best Performer Plaque**



the mean so that it was consistent with the ratings for exciting, interesting, and rewarding.

Our first independent variable, WAGE, was the form of cash incentive. There were two conditions. In the first condition, participants received a fixed wage (FW) for each production session regardless of their actual output. In the second condition, participants received a fixed wage plus bonus (FWB) for production up to the assigned budget (equal to 105% of each participant's average trial session performance) and a piece-rate bonus for each unit produced above the target. In other research, this quota scheme has consistently produced a larger effect on task performance than strictly piece-rate schemes or tournament schemes.[11] Recent managerial accounting research has used the quota scheme extensively to examine how cash incentives interact with budget-setting procedures and information presentation.[12] In our setting, we expected the quota incentive to increase participants' perception of being controlled; it will, therefore, decrease task performance while decreasing perceived task attractiveness as the extrinsic incentive crowds out intrinsic motivation.

Our second independent variable, INTANG, is whether there is an intangible noncash incentive, which took the form of a recognition "plaque" for the best performer in the prior production period. Figure 2 depicts the "plaque" that we projected at the front of the laboratory. Following each production period, we updated the name to reflect the best performer from the period.[13] We expected the presence of an intangible noncash incentive to increase effort and, hence, task performance, though not incrementally to the cash incentive. We also expected that the presence of an intangible noncash incentive would interact with the quota scheme to reduce the crowding-out effect of the quota scheme because the intangible noncash award is

determined relative to other workers; it may therefore be perceived as less controlling.[14]

Our third independent variable, TANG, was a tangible noncash incentive that took the form of a chocolate bar wrapped in the university's colors and logo.[15] At the end of each production period, we gave the chocolate bar to the participant who decoded the most letters correctly. We expected that the presence of a tangible noncash incentive would interact with the quota scheme to reduce the crowding-out effect of the quota scheme because the tangible noncash award is determined relative to other workers; it may therefore be perceived as less controlling.

Procedure

Our target was 20 participants per experimental condition, and there were 147 total participants. We assigned the experimental conditions to scheduled runs randomly. Because of the nature of the incentive treatments, however, all participants in any given session performed under the same conditions (that is, if we projected a "Best Performer" plaque on the laboratory screen, we could not ask some participants to ignore its presence). Each session proceeded as follows.

1. Participants entered the laboratory for their scheduled session. The administrator distributed and reviewed the informed consent forms, witnessed the participants' signatures, and collected the forms.
2. The administrator directed each participant to the Web address for the experiment and instructed the participants to begin.
3. Participants followed the computer-based instructions through a brief training session, after which the administrator answered any procedural questions about the letter-decoding task.
4. Participants engaged in three practice sessions, receiving feedback on their performance (number of letters decoded correctly) after each session. After the third session, participants provided an estimate of their performance capability and an assessment of task attractiveness.
5. Participants learned of their cash incentive via the computer-based instructions. Participants stopped after they correctly answered three questions designed to confirm their understanding of the cash compensation scheme.
6. The administrator introduced the noncash treatments (if any) to the participants, then described and displayed the "plaque," the chocolate bar, or both, as appropriate.
7. Participants engaged in three production sessions. At the end of each session, they received feedback about their performance, information about their cash earnings, and any noncash award (if applicable).
8. Participants completed the post-experiment questionnaire.
9. Participants took their earnings confirmation sheet to the cashier in another room and collected their earnings.

Findings

We explored the complex relationships between cash and noncash incentives by examining the different effect of noncash incentives depending on whether a cash incentive was present. We found three main results. First, a comparison of performance with and without the cash incentives (ignoring the noncash incentive dimension) shows that performance is worse, on average, when the cash incentive is available. This result is consistent with motivation crowding. Second, when there was no cash incentive (that is, participants earned a fixed amount of cash regardless of their decoding performance), the introduction of noncash incentives had no effect on performance. This result is surprising in light of our expectations regarding noncash incentives. Finally, when participants were eligible for a cash incentive, introducing either intangible or tangible noncash rewards significantly increased performance. Introducing both types of noncash incentives simultaneously, however, did not improve performance further.

Our results are important for practitioners designing or adapting incentive systems. First, if a firm is a start-up or has no performance-contingent cash reward, it may be best to use only a flat wage and elicit effort through noncash reward mechanisms. Our participants did not respond to the noncash rewards in the flat wage condition. Second, a firm with a performance-contingent cash reward may, indeed, have destroyed workers' intrinsic motivation through suppression of

Table 1: Descriptive Statistics by Experiment Cell

	WAGE	INTANG	TANG	Mean Production Session Performance Mean	[Standard Deviation]	(N)
1	FW	No	No	99.45	[13.18]	(23)
2	FW	Yes	No	98.54	[10.38]	(18)
3	FW	No	Yes	100.56	[10.89]	(16)
4	FW	Yes	Yes	97.33	[9.48]	(19)
5	FWB	No	No	73.28	[20.04]	(19)
6	FWB	Yes	No	106.44	[13.42]	(18)
7	FWB	No	Yes	98.42	[11.86]	(19)
8	FWB	Yes	Yes	99.62	[13.35]	(15)

WAGE = FW Participants receive a fixed wage for each production session, regardless of performance
= FWB Participants receive a fixed wage for each production session plus a bonus for each letter decoded correctly above the target

INTANG = No No "Best Performer Plaque" incentive available
= Yes "Best Performer Plaque" incentive available

TANG = No No chocolate bar incentive available
= Yes Chocolate bar incentive available

autonomy and/or competence. Because many see eliminating incentive programs as likely to cause even worse motivational problems, firms may try to increase the incentive power of cash rewards only. Our results, however, suggest that firms may be better off introducing noncash reward programs, which can offset the motivational suppression of cash rewards.

Turning to the specifics of the results, Table 1 presents the mean and standard deviation for one of our primary dependent variables—production performance (average number of letters decoded)—for each of the experimental conditions. Mean production performance was highest for those participants eligible for a cash bonus and an intangible noncash bonus (average of 106.44 letters decoded). Mean production performance was lowest for those participants eligible for a cash bonus but not eligible for any noncash incentives (average of 73.28 letters decoded), consistent with the cash incentive crowding out intrinsic motivation.

Table 2 features the results of an analysis of covariance (ANCOVA) in which production task performance is the dependent variable and pre-experimental task attractiveness serves as a covariate. The overall model is highly significant ($F = 11.686$, $p < 0.001$), supporting the hypotheses that noncash incentives affect production task performance. Almost all of the factors and interactions are significant at $p < 0.001$, including the three-way interaction of WAGE, INTANG, and TANG. To understand the implications of this significant interaction, it is helpful to consider the results for each type of cash incentive separately.

Figures 3 and 4 depict the mean production task performance by cell. Figure 3 shows that the mean performance in the fixed-wage condition was independent of the presence or absence of any form of noncash incentive. Figure 4, however, shows that mean performance

Table 2: ANCOVA for Production Task Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	15,005.801	8	1,875.725	11.686	0.000
Intercept	147,870.051	1	147,870.051	921.230	0.000
Pre-Production Attractiveness	2,214.102	1	2,214.102	13.794	0.000
WAGE	857.812	1	857.812	5.344	0.022
TANG	755.254	1	755.254	4.705	0.032
INTANG	2,563.663	1	2,563.663	15.972	0.000
WAGE * TANG	1,049.546	1	1,049.546	6.539	0.012
WAGE * INTANG	3,334.155	1	3,334.155	20.772	0.000
TANG * INTANG	2,011.183	1	2,011.183	12.530	0.001
WAGE * TANG * INTANG	1,847.693	1	1,847.693	11.511	0.001
Error	22,150.884	138	160.514		
Total	1,407,312.222	147			
Corrected Total	37,156.685	146			

$R^2 = 0.327$ (Adjusted $R^2 = 0.288$)

Figure 3: Production Performance with Flat Wage

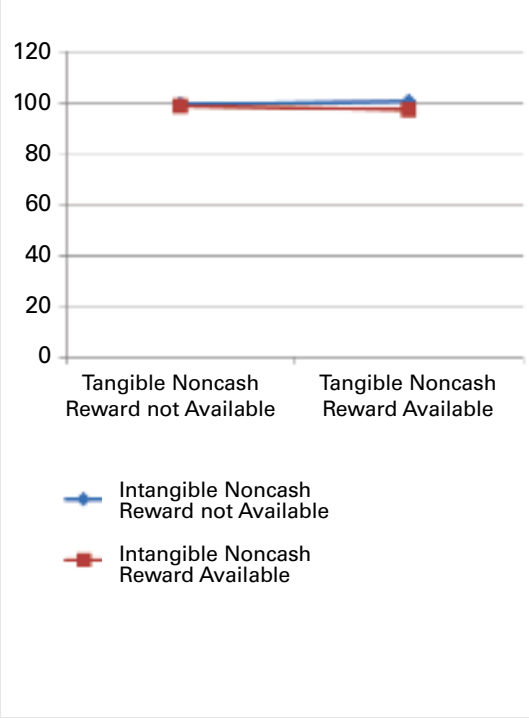


Figure 4: Production Performance with Flat Wage plus Cash Bonus

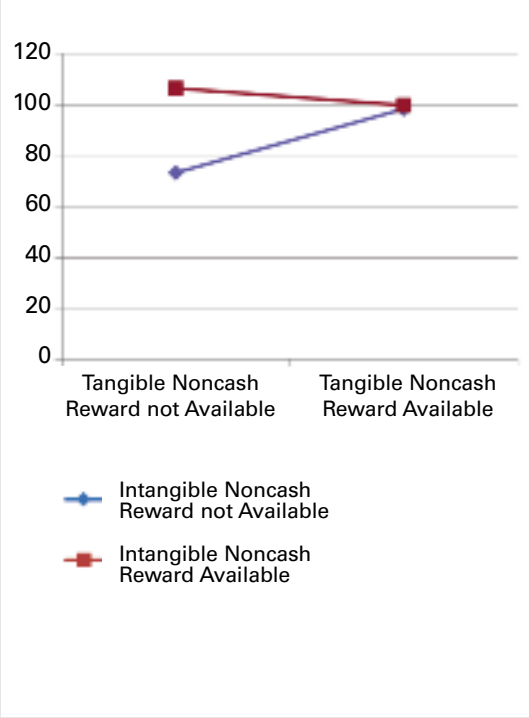


Table 3: ANCOVA for Post-Production Task Attractiveness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	105.691	8	13.211	2.888	0.006
Intercept	220.344	1	220.344	48.172	0.000
Pre-Production Attractiveness	67.234	1	67.234	14.699	0.000
WAGE	4.373	1	4.373	0.956	0.330
TANG	10.586	1	10.586	2.314	0.131
INTANG	0.092	1	0.092	0.020	0.887
WAGE * TANG	15.870	1	15.870	3.469	0.065
WAGE * INTANG	2.420	1	2.420	0.529	0.469
TANG * INTANG	4.953	1	4.953	1.083	0.300
WAGE * TANG * INTANG	0.018	1	0.018	0.004	0.950
Error	494.001	108	4.574		
Total	4,425.000	117			
Corrected Total	599.692	116			

$R^2 = 0.335$ (Adjusted $R^2 = 0.285$)

was much worse when the only incentive available was cash. Performance improved when either type of noncash incentive was present, although having both types of noncash incentives did not increase performance further.

Table 3 features the results of an ANCOVA in which post-experimental task attractiveness is the dependent variable and pre-experimental task attractiveness serves as a covariate. The overall model is highly significant ($F = 2.888$, $p < 0.006$), supporting the hypotheses that noncash incentives affect post-production task attractiveness. Only one interaction (WAGE * TANG), however, is significant. This suggests that the presence of a tangible noncash incentive affects task attractiveness and that the magnitude of the effect depends on whether the piece-rate bonus is present.

Closing Thoughts

The results of this experiment provide an interesting look into the behavioral effect of noncash rewards. Because the use of noncash rewards is widespread, it is important to understand the impact the choice of incentive will have on employee performance. The results of the experiment show that employers would benefit by having a noncash reward system in place when they already have a cash bonus system. Specifically, the participants eligible for a cash bonus and an intangible noncash reward had the best performance (see Figure 4), and the lowest-performing participants were those eligible for a cash bonus only. Participants eligible for a cash bonus and tangible reward (with or without eligibility for an intangible reward) performed at the same level as those participants in the flat-wage scenarios. These results support the theory that cash bonus incentives can deteriorate performance and that noncash incentives can help mitigate such negative effects.

Our results demonstrate that research into the conditions under which the benefits of noncash incentives are greater than the costs to the firm employing them has the potential to contribute to both managerial accounting research and practice. This research provides evidence that such incentives affect production-task performance and attractiveness, but much more work remains to be done to elaborate the precise nature of the relationships. ■

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Endnotes

1. Incentive Research Foundation, "2012 Trends in Rewards and Recognition," http://theirf.org/research/content/6085946/2012-trends-in-rewards-recognition; Martin Dewhurst, Matthew Guthridge, and Elizabeth Moh, "Motivating People: Getting Beyond Money," *McKinsey Quarterly*, 2009, www.mckinseyquarterly.com/Motivating_people_Getting_beyond_money_2460.
2. Scott A. Jeffrey and Victoria Shaffer, "The Motivational Properties of Tangible Incentives," *Compensation & Benefits Review*, June 2007, pp. 44-50; Richard Long and John Shields, "From Pay to Praise? Non-cash Employee Recognition in Canadian and Australian Firms," *International Journal of Human Resource Management*, June-July 2010, pp. 1145-1172.
3. Sarah E. Bonner, Reid Hastie, Geoffrey B. Sprinkle, and S. Mark Young, "A Review of the Effects of Financial Incentives on Performance in Laboratory Tasks," *Journal of Management Accounting Research*, December 2000, pp. 19-64.
4. Incentive Research Foundation, "The State of Tangible Incentive Research: The Use of Tangible Incentives," http://theirf.org/direct/user/site/0/files/2011-StateofTangibleIncentiveResearch.pdf, 2011.
5. Richard A. Lambert, "Contracting Theory and Accounting," *Journal of Accounting and Economics*, February 2001, pp. 3-87.
6. Edward L. Deci, Richard Koestner, and Richard M. Ryan, "A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation," *Psychological Bulletin*, November 1999, pp. 627-668.
7. Edward L. Deci and Richard M. Ryan, *Intrinsic Motivation and Self-Determination in Human Behavior*, Plenum Press, New York, N.Y., 1985.
8. Bruno S. Frey and Reto Jegen, "Motivation Crowding Theory," *Journal of Economic Surveys*, December 2001, pp. 589-611. Motivation crowding theory discusses incentives' effects on individuals' perceptions of self-determination and self-esteem. These constructs are similar in nature to those central to SDT.
9. Joseph G. Fisher, James R. Frederickson, and Sean A. Peffer, "Budgeting: An Experimental Investigation of the Effects of Negotiation," *The Accounting Review*, January 2000, pp. 93-114; Joseph G. Fisher, Laureen A. Maines, Sean A. Peffer, and Geoffrey B. Sprinkle, "Using Budgets for Performance Evaluation: Effects of Resource Allocation and Horizontal Information Asymmetry on Budget Proposals, Budget Slack, and Performance," *The Accounting Review*, October 2002, pp. 847-865.
10. Participants have the option to complete a three-page research paper on ethics in the accounting profession to earn the course credit associated with being part of the research pool.
11. Bonner, et al., 2000.
12. Fisher, Frederickson, and Peffer, 2000; Fisher, Maines, Peffer, and Sprinkle, 2000; and Christopher J. Wolfe and Uday S. Murthy, "Negotiation Support Systems in Budget Negotiations: An Experimental Analysis," *Journal of Management Information Systems*, Winter 2006, pp. 351-381.
13. We did not inform participants of the intangible noncash incentive (when present) until after they had completed all trial sessions and demonstrated that they understood their cash compensation scheme. For the first production period, "Your Name Here" appeared on the "plaque."
14. An alternative operationalization would be to recognize on the "plaque" all participants who performed above a certain level. This would be a more general form of recognition and would reduce the potential for the recognition of a single participant to demotivate those not recognized.
15. We did not inform participants of the tangible noncash incentive (when present) until after they had completed all trial sessions and demonstrated that they understood their cash compensation scheme.