



HARVARD Kennedy School
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

The Demotivating Effect (and Unintended Message) of Retrospective Awards

Faculty Research Working Paper Series

Carly D. Robinson

Harvard University

Jana Gallus

University of California Los Angeles

Monica G. Lee

Stanford University

Todd Rogers

Harvard Kennedy School

July 2018

RWP18-020

Visit the **HKS Faculty Research Working Paper Series** at:

https://www.hks.harvard.edu/research-insights/publications?f%5B0%5D=publication_types%3A121

The views expressed in the **HKS Faculty Research Working Paper Series** are those of the author(s) and do not necessarily reflect those of the John F. Kennedy School of Government or of Harvard University. Faculty Research Working Papers have not undergone formal review and approval. Such papers are included in this series to elicit feedback and to encourage debate on important public policy challenges. Copyright belongs to the author(s). Papers may be downloaded for personal use only.

The Demotivating Effect (and Unintended Message) of Retrospective Awards

Carly D. Robinson

Harvard Graduate School of Education, Harvard University

Jana Gallus

Anderson School of Management, UCLA

Monica G. Lee

Center for Education Policy Analysis, Stanford University

Todd Rogers, PhD

Harvard Kennedy School, Harvard University

Abstract

It is common for organizations to offer awards to motivate individual behavior, yet few empirical studies evaluate their effectiveness in the field. We report a randomized field experiment ($N = 15,329$) that tests the impact of two types of symbolic awards on student attendance: pre-announced awards (prospective) and surprise awards (retrospective). Contrary to our pre-registered hypotheses, prospective awards had no impact while the retrospective awards *decreased* subsequent attendance. Survey studies provide evidence suggesting that receiving retrospective awards may demotivate the behavior being awarded by inadvertently signaling (a) that recipients have performed the behavior more than their peers have; and (b) that recipients have performed the behavior to a greater degree than was organizationally expected. A school leaders survey shows that awards for attendance are common, and that the organizational leaders who offer these awards are unaware of their potential demotivating impact.

Keywords

Awards, Motivation, Attendance

Introduction

Awards are commonly used in many different sectors to motivate desirable behaviors (see Frey & Gallus, 2017). Over 80% of corporations reportedly use awards (Garr, 2012), such as “Employee of the Month” awards for top salespeople (Larkin, 2011; Lourenco, 2016) or awards that recognize perfect attendance (Markham, Scott, & McKee, 2002; Gubler, Larkin, & Pierce, 2016). The education sector has a particularly elaborate system of honors and awards for school children (Deci, Koestner, & Ryan, 2001) as well as for eminent scientists (Chan et al. 2014). In fact, the state of California introduced a bill that encourages school administrators to “recognize pupils who achieve excellent attendance or demonstrate significant improvement in attendance” (Assembly Bill No. 2815, 2016). Given the prevalence of awards, there is surprisingly little empirical evidence on their impacts in the field.

We conduct a randomized field experiment to examine the impact of symbolic awards on individual behavior ($n = 15,329$). We study two types of awards: pre-announced awards (*prospective awards*) and surprise awards (*retrospective awards*), both of which are designed to motivate middle and high school student attendance. Our findings show that the prospective awards do not affect behavior, while the retrospective awards unexpectedly demotivate the target behavior. To explore the underlying mechanisms, we conducted a follow-up study (Study 2) which suggests that the demotivating effects of retrospective awards may result from two inadvertent signals communicated by the fact receiving the awards. First, that award recipients have performed the behavior (attended school) more than their peers have. And second, that recipients have performed the behavior to a greater degree than was organizationally expected. Study 3 is a survey of school leaders showing that awards for attendance are common, and that

the organizational leaders who offer these awards are unaware of their potential demotivating impact.

Theoretical Background

Types of Awards

Awards take many different forms (see Gallus & Frey, 2016 Table 1 for some of the major types and characteristics). First, awards can be either material (e.g. accompanied by a monetary bonus; Angrist & Lavy, 2009) or symbolic (e.g., a trophy; Levitt, List, Neckermann, & Sadoff, 2016); we focus on the latter, which do not have monetary value. Employers may prefer symbolic awards because they avoid the financial and psychological costs (e.g., motivation crowding-out) of monetary ones (Frey, 2007). Second, awards can be based on absolute performance (Angrist & Lavy, 2009), relative performance compared to peers (Bursztyn & Jensen, 2015), or relative performance where the reference point is the individual's own past behavior (Levitt et al., 2016). We study awards that recognize absolute performance and are hence non-competitive.

Third, awards can be offered prospectively (i.e., the criteria for earning the award are stipulated in advance) or given retrospectively as recognition for past behavior (see notably Bénabou & Tirole, 2003, who point out the importance of this distinction). *Prospective awards* are "pre-announced" or "ex ante" contingent rewards, also referred to as "if-then" motivators. Leaders define their expectations in advance and aspirants can work towards fulfilling them in order to attain the award. These awards are closely in line with the traditional economic focus on incentives,¹ with the exception that the promise of monetary pay is replaced by a non-monetary

¹ There is an extensive literature in economics on explicit, ex ante incentives, either for absolute performance (e.g., piece rate schemes as in Gneezy and Rustichini, 2000 and Lazear, 2000) or based on workers' performance compared to that of peers (e.g., rank-order tournaments as in Lazear and Rosen 1981). Surprise rewards have more recently received greater attention thanks to the advent of behavioral research, and specifically one of its most

incentive. *Retrospective awards* are “now-that” motivators, or “ex post” rewards. They acknowledge a job well done after a task is completed and come as a surprise to recipients (e.g., so-called “spot awards” are widely used to honor workers for their commitment to the firm or job). While there is concern that announced awards may undermine people’s intrinsic motivation much like monetary incentives would, retrospective awards are often considered more appropriate to preserve recipients’ sense of autonomy and boost their intrinsic motivation (Bénabou & Tirole, 2003; Gallus & Frey, 2016).

Retrospective awards may be motivating because people are often unsure about their own ability and performance given the context they are in (e.g., in comparison to others’ performance, the manager’s or institution’s norms and goals). Receiving an award allows the recipients to make inferences about their performance and recalibrate beliefs about their behavior as well as contextual factors such as the giver’s beliefs and expectations (Gallus & Frey, 2017). As explained by Bénabou and Tirole (2003): “the worker or child learns from the [ex post] reward that the task was considered difficult (and therefore that he is talented), or that the supervisor or parent is appreciative of, proud of, or cares about his performance – and therefore that it is worth repeating it” (p. 504).² Further advantages of retrospective awards from a managerial perspective are that they reduce the risk of multitasking (Holmstrom & Milgrom, 1991) and strategic gaming (Gubler et al., 2016),³ and that they are less likely to entail image motivation crowding-out (as

influential lines, which focuses on gift exchange and reciprocity (see Gneezy and List, 2006 for a seminal study that set forth an experimental design for testing gift exchange in the field). The focus of the gift exchange literature is largely on monetary pay (which is offered by surprise and unconditionally after the workers have accepted a job). See Gilchrist, Luca, and Malhotra (2016) for a discussion of the latest state of this literature and a recent online field experiment finding positive effects of a surprise raise on subsequent performance.

² Kamenica (2012) discusses how contextual inference may explain many of the inconsistent responses to incentives found in the empirical literature.

³ Intriguingly, a recent natural field experiment by Flory, Leibbrandt, and List (2016) shows that adding surprise retrospective bonus rewards can substantially reduce the worker misbehavior produced by prospective, relative performance pay contracts, indicating the value of using both types of rewards as complements.

when the presence of incentives can make observers question the person's true motivations: the reward or the underlying activity; see Gneezy, Meier, & Rey-Biel, 2011).

In the emerging literature on awards, most attention has previously been paid to prospective, announced awards (Kosfeld & Neckermann, 2011; Ashraf, Bandiera, & Lee, 2014; Levitt et al., 2016). More recently, however, scholars have started to explore the effects of surprise, retrospective awards. Unlike our study, which looks at non-competitive awards based on focal students' attendance, most of the empirical evidence revolves around awards for relative performance, in effect recognizing the best among a group according to some clearly measurable criteria (Bradler, Dur, Neckermann, & Non, 2016; Hoogveld & Zubanov, 2017; Neckermann & Yang, 2017; Gallus & Heikensten, 2018). These experiments mostly suggest that it is *non-recipients* (i.e., low performers who were made aware of but did not receive the retrospective award) who react to the intervention by increasing their subsequent performance, while the recipients' performance remains largely unaffected—possibly because people have a preference for conformity to descriptive social norms.

A field experiment by Gallus (2017) on symbolic awards given to voluntary Wikipedia editors is an exception, in that the recognition does not only go to high performers based on clearly measurable tasks. The experiment randomizes who receives the purely symbolic award out of a set of new editors who have all passed some pre-determined but undisclosed performance threshold. The analysis shows significant and long-lasting positive effects on the recipients' subsequent behavior (retention), which may be explained by increased self-identification with the community and the motivational effects of status and recognition.

We are only aware of one prior study that tests both prospective and retrospective awards within the same context. In a seminal experiment with 3-5-year-old nursery school children,

Lepper, Greene, and Nisbett (1973) find that the promise of receiving a “Good Player” award for playing with magic markers shortened the amount of time the children subsequently opted to play with the markers. Importantly, no such effect was found when the award was given retrospectively. The authors attributed the negative effect of the prospective award to a change in children’s self-perception, which undermined their intrinsic interest in the task (see also Deci et al, 2001).

Potential Negative Consequences of Awards

The widespread use of awards is based on the simple and intuitive appeal that recognizing effort and performance will result in improved or continued positive performance. For this reason, awards are often used without a full understanding of whether or how they produce the intended behavior.⁴ However, awards need not always induce desirable behaviors. While it seems clear that non-recipients may respond negatively (e.g., due to envy), it is important to note that even recipients’ behavior can be adversely impacted. For example, an analysis of CEOs who won prestigious business accolades found that the recipients’ firms subsequently underperformed, while the CEOs extracted higher compensation and pursued more privately beneficial activities, such as assuming outside board seats and writing books (Malmendier & Tate, 2009).

There are three main reasons why even retrospective awards may have unintended negative effects on the recipients’ behavior. First, recipients may infer from the awards that their *own* performance does not conform to the social norm and that they are doing more than required. This may lead to reduced effort, particularly if the behavior is inconsequential and not a reflection of the recipients’ abilities and achievements on an important performance dimension.

⁴ See Gneezy, Meier, & Reybiel (2011) and Kamenica (2012) for a discussion of the empirical evidence on the unintended effects of monetary incentives and the mechanisms to explain them.

Second, awards may send inadvertent signals about the *giver's* intent or expectations, such as when awards cause the recipients (and audience) to infer that they have exceeded (low) institutional expectations (Gallus & Frey, 2017). Both of the aforementioned signaling mechanisms echo the conclusions of Bénabou and Tirole (2003), but – as we will argue – the resulting behavioral change need not be positive.

Third, while many studies have shown that people have an inherent preference for high rank and status (Huberman, Loch, & Oencueler, 2004; Blanes i Vidal & Nossol, 2011; Tran & Zeckhauser, 2012), awards may single out individuals in a context where the social costs of being singled out outweigh the benefits of the distinction. Using a natural experiment, Bursztyn and Jensen (2015) found that the introduction of a performance leaderboard singling out the top three students led to a 24 percent performance decline in a context where effort was observable to peers and risked provoking social penalties among students. The strongest effect was seen among previously high-performing students, indicating that the desire to avoid the leaderboard in the future may have driven these results (see also Jones & Linardi, 2014, Bradler et al., 2016).

The present research differs from previous studies on several dimensions. First, as far as we know, our study is the first to examine the impact of offering both prospective and retrospective awards to subjects in the same field context. Second, most of the research to date has focused on rewarding outcomes (e.g., performance), while our study explores how awards for important inputs (e.g., attendance) affect behavior. Third, we minimize the concern about peer social sanctions by sending awards directly to the recipients' homes. Moreover, we rule out incentive effects (of possibly being singled out in the future) by clearly communicating that the award would remain a one-off event. Fourth, our study examines mechanisms behind the effects of awards; in particular, inadvertent signaling by the institution and contextual inference about

one's performance compared to the norm. Finally, our study provides the first empirical evidence documenting unintended effects of retrospective awards on recipients' subsequent behavior.

Awards and Attendance

This research examines how prospective and retrospective symbolic awards impact student attendance. Absenteeism is an important input factor that impedes both individual and organizational success across many sectors. Employee absenteeism in the US is estimated to cost organizations \$202 billion each year (Goetzel, 2004) and student absenteeism robustly predicts educational failure, such as student drop out (Balfanz & Byrnes, 2012).

Mirroring organizations' desire to reduce absenteeism in workplace settings, schools and local educational agencies have also sought to make improving attendance a national priority (e.g., Every Student Succeeds Act, 2015). To date, there are only a handful of successful experimentally-proven programs that reduce absenteeism and are scalable (e.g. Rogers & Feller, 2018; Robinson, Lee, Dearing, & Rogers, 2018; Guryan, et al., 2017). Despite little experimental research on how to effectively reduce absences—or perhaps because of it—many education organizations use awards to motivate good attendance. As aforementioned, California legislation encourages schools to award students for excellent or improved attendance (Assembly Bill No. 2815, 2016). Attendance Works, a leading national organization focused on improving student attendance, recommends implementing school-wide attendance award initiatives, much like those widely used in firms to reward motivated workers who always show up. Employers and school leaders assume that acknowledging someone's effort and persistence will keep them motivated (e.g., Fagnani, 2018).

As outlined above, research shows conflicting results of offering awards for performance. The evidence on offering awards for attendance is no different. One study on absenteeism in the

workplace found that personal recognition for good attendance significantly decreased employee absenteeism: receiving recognition for attendance resulted in a 23-percentage point reduction in employee absences (52% to 29%) in a manufacturing plant (Markham et al., 2002). Another study found that an attendance award had short-term positive effects on low-attending employees, but the extrinsic reward from the program crowded out the internal motivation of those employees who had previously demonstrated excellent attendance and resulted in negative effects during the award period (Gubler, Larkin, & Pierce, 2016). The researchers contend the award may have backfired because it failed to acknowledge those who had in the past espoused the desired behavior, prior to the introduction of the award program. Finally, in the education literature, a small experiment recently found that students in an out-of-school program setting who were offered a prospective symbolic award for their attendance attended 42.5% more tutoring hours than students assigned to the control group (Springer, Rosenquist, & Swain, 2015).

Current Research

The current research examines the impact of offering symbolic awards for attendance through three studies. Study 1 reports a randomized field experiment (N = 15,329) that tests the impact of two types of symbolic awards on student attendance: prospective awards and retrospective awards. The intervention targeted students in grades 6-12 across 14 urban, suburban, and rural school districts on the West Coast of the United States. It involved delivering mail-based communications directly to homes of students, as this is the main channel for official communications from schools and school districts.

Contrary to our pre-registered hypotheses, students did not miss fewer days of school when offered the chance to earn a prospective attendance award, and they missed more days of

school after receiving a retrospective award for past attendance. We conducted two follow-up studies to explore why retrospective awards may be demotivating (Study 2) and to assess the prevalence in schools of awards on attendance as well as to assess the intuitions of school leaders about the impact of such awards (Study 3).

Study 1: Field Experiment

Participants

The sample of Study 1 consisted of 15,629 students across 14 school districts in a diverse county in California. It included all 6th through 12th grade students who did not have a sibling in grades K-12 (these households participated in a different, unrelated experiment and were therefore not eligible for the present study). The sample excluded students with inconsistent records of pre-randomization absences (where our two sources of absence data suggested different counts of days absent), students with unreliable addresses, students who opted out or whose opt-out consent forms were undeliverable, and students belonging to school-grade combinations of less than six students (for randomization purposes). To be able to randomly assign who would receive the award, the sample was restricted to participants who had achieved perfect attendance in at least one fall month (e.g., zero absences in September, October, or November) of that year, which included 88% of the otherwise eligible population.

We did not receive outcome data for 1.92% of the eligible students, so the final analytic sample consists of 15,329 students. Students for whom we did not have outcome data were balanced equally across conditions ($p = .11$). Table 1 shows the baseline participant demographic information by condition. Participants in the final analytic sample were absent on average 0.42 to 0.46 days in each month from September through November, i.e., prior to the intervention. High school students (grades 9-12) comprised 76% of the sample. Thirty-five percent of students in

our sample were identified as English Language Learners (ELL) and 20% of participants came from primarily Spanish-speaking households. ELL status was missing for 7% of the sample.

Table 1. Baseline equivalence among three conditions and overall demographics of the final analytic sample

Variables		Condition			Total	p-value
		Control	Prospective	Retrospective		
Language of letters	English	80.3%	80.2%	79.9%	80.1%	0.89
	Spanish	19.7%	19.8%	20.1%	19.9%	
ELL status	Non-ELL	58.0%	58.8%	57.9%	58.2%	0.85
	ELL	35.2%	34.5%	35.0%	34.9%	
	Missing	6.8%	6.7%	7.1%	6.9%	
Prior absences	September	0.39	0.42	0.44	0.42	0.12
		(1.03)	(1.23)	(1.15)	(1.14)	
	October	0.43	0.41	0.43	0.43	0.59
	November	(1.03)	(1.04)	(1.00)	(1.02)	
		0.46	0.48	0.45	0.46	0.33
		(0.99)	(1.00)	(0.94)	(0.98)	
Grade	6	8.6%	8.6%	8.5%	8.6%	1.00
	7	8.7%	8.6%	8.7%	8.7%	
	8	7.2%	7.2%	7.2%	7.2%	
	9	17.9%	17.8%	18.0%	17.9%	
	10	19.7%	19.7%	19.7%	19.7%	
	11	19.6%	19.6%	19.5%	19.5%	
	12	18.4%	18.4%	18.4%	18.4%	
N		5,109	5,099	5,121	15,329	

Standard deviations in parentheses.

p-values for ELL status, Language of letters, and Grade are from Chi-squared tests.

p-values for Prior absences are from ANOVA.

Procedures & Measures

We tested the impact of sending students symbolic awards for attendance by randomly assigning grade 6-12 students who had perfect attendance in one fall month (i.e., zero absences in either September, October, or November) to one of three conditions⁵: (1) Control (students

⁵ We also randomly assigned students to receive the awards privately or with a mention that their principal and superintendent would be informed, within both the *Prospective Award* and *Retrospective Award* conditions. Because

received no additional communications) ($n = 5,216$), (2) *Prospective Award* ($n = 5,209$), or (3) *Retrospective Award* ($n = 5,204$). We performed a stratified randomization by school and grade.

Students in both award conditions received a mailing the last week of January 2016. Students in the *Prospective Award* condition received a letter telling them that they would have the opportunity to earn an award if they had perfect attendance in February (i.e., the upcoming month). A picture of an award certificate that they would earn from the county office was printed on the letter. Students in the *Retrospective Award* condition received a letter telling them they had earned an award for perfect attendance in a fall month; the personalized award certificate was enclosed with the letter. In both award conditions it was noted that the award would not be offered again that year. For both award conditions, mailings were sent to students on the same date using identical-looking envelopes, with the only difference being the aforementioned content about the awards. Students with Spanish as their home language according to district records received letters in Spanish. All other letters were in English. See Figure 1 for an example of the intervention materials.

assignment to these conditions did not significantly affect the results (i.e., there was no marginal impact of an award being public), we do not discuss the theoretical rationale for their inclusion for parsimony.

Figure 1. Study 1 Intervention Materials


A) Prospective Award Letter

Dear Sammy,

You can earn an award if you have perfect attendance in February!

If you have zero absences* in February, you will receive the Perfect Attendance Award (like the one below). The award will be sent to you in the mail, and it will not be offered again this school year.

Sample Perfect Attendance Award:



Sincerely,
George Washington
American County Superintendent

*For more information on how absences are determined, please visit www.snooco.org/attendance/matters. This letter is part of the Attendance Matters Project, which aims to increase awareness about the importance of attendance in American County. Please visit www.snooco.org/attendance/matters if you have any questions. Please be sure to provide your unique four-digit code in all communications. **A128**. If you received this card in error or have already opted out of receiving these cards, please disregard this one. We apologize for the inconvenience.

B) Retrospective Award Letter + Award

Dear Sammy,

You have earned an award for having **perfect attendance!** You attended school every day for one month this school year during the fall semester.

To recognize that **you had zero absences for one month, we present you with the Perfect Attendance Award**, enclosed with this letter. The award will not be offered again this school year.

Sincerely,
George Washington
American County Superintendent

*For more information on how absences are determined, please visit www.snooco.org/attendance/matters. This letter is part of the Attendance Matters Project, which aims to increase awareness about the importance of attendance in American County. Please visit www.snooco.org/attendance/matters if you have any questions. Please be sure to provide your unique four-digit code in all communications. **A128**. If you received this card in error or have already opted out of receiving these cards, please disregard this one. We apologize for the inconvenience.



We pre-registered an analysis plan (Rogers, 2016) before receiving outcome data from the school districts and pre-specified the following hypotheses:

- Hypothesis 1: Students in the treatment conditions (the *Prospective Award* and *Retrospective Award* conditions pooled together) will have improved attendance in the target month as compared to students in the control group.
- Hypothesis 2: Students in the *Prospective Award* condition will have improved attendance in the target month as compared to students in the *Retrospective Award* conditions.

The primary outcome variable was the student's number of absences in February. We also examined whether students attained zero absences in February (i.e., the goal of the *Prospective Award* condition). In both cases, the total number of absences included both excused and unexcused absences because we did not receive excused absence flags from all school districts. Prior research suggests that the results are consistent whether examining excused and unexcused absences separately or together (Rogers & Feller, 2018).

We collected demographic variables from the school districts to use as covariates in the analysis, along with student absences in the pre-study months of September, October, and November. Demographic variables included the student's primary language spoken at home and ELL status. Home language was a binary covariate for whether letters were sent in English or Spanish. Because ELL status was not available for 7% of the final analytic sample, we imputed missing ELL status as non-ELL in a binary covariate and included an indicator for missing ELL status in all models using ELL status as a covariate.

Socioeconomically disadvantaged status was not available for 26% of the sample and was therefore not included in the analysis. School and grade level were accounted for as strata fixed

effects. The districts also provided the number of absences for a given student in February, which is the outcome of interest in this study. At the end of the year, we received standardized test scores for only 24% of the sample ($n = 3,680$).

We checked for balance across conditions in the analytic sample using a multinomial logistic regression with condition assignment as dependent variable and baseline variables as independent variables.

To assess our hypotheses, we first employed Fisher Randomization Tests (FRT) to obtain exact p -values to determine whether there was a statistically significant treatment effect on student absences (Athey & Imbens, 2016). Second, we fit linear regression models to estimate the Average Treatment Effect (ATE) of random assignment to the treatment condition on student absences. To examine the ATE on perfect attendance, we used logit regression models. Our final models adjusted for student-level demographic indicators, student fall absences, and the student's school and grade level.

Results

Check for Baseline Equivalence

We checked to ensure the treatment and control groups were balanced across covariates (i.e., the primary language spoken at home, ELL status, pre-study absences, and randomization strata). The covariates in the model did not jointly predict treatment assignment, LR $\chi^2(308, n = 15,329) = 19.62, p > .99$.

Student Absences & Perfect Attendance

Contrary to our pre-registered hypothesis, our analysis shows that the awards had no positive effect on attendance; they may have had unintended negative effects on their recipients' subsequent behavior, although the difference is not statistically significant. Our final model with

student covariates and school and grade fixed effects indicates that students assigned to the control condition were absent an average of 0.72 days in February and 62.55% had perfect attendance. Students assigned to one of the two treatment conditions were absent an average of 0.03 days *more* than students in the control group ($SE = 0.021$, $FRT\ p = .122$), amounting to a regression-adjusted increase of 4.58% or an unadjusted effect size of 0.028. Compared to the control group, students in the treatment conditions were also one percentage point less likely to have perfect attendance in February, a 1.5% reduction, $p = .218$. See Supplementary Table 1 for details.

Table 2 shows the results broken out by each treatment condition. We found that students assigned to the *Prospective Award* condition did not differ from students in the control condition in the number of days of school they were absent in February, $B = 0.006$, $SE = 0.024$, $FRT\ p = .819$. The groups also did not differ in the fraction of students who had perfect attendance in February (62.42% compared to 62.55% in the control; $\beta = -0.006$, $SE = 0.044$, $p = .887$).

The results in Table 2 show that the negative directional effects reported in Table 2 were driven by students who were retrospectively offered awards as a surprise for their prior positive behavior. Compared to the control group, students assigned to the *Retrospective Award* condition were absent 0.06 more days ($SE = .025$, $FRT\ p = .018$), which corresponds to a regression-adjusted 8.3% increase in absences in the month of February, or an unadjusted effect size of 0.047. These students were also about two percentage points less likely to have perfect attendance in February (60.75% compared to 62.55% in the control), a 2.9% reduction ($\beta = -0.086$, $SE = 0.043$, $p = .047$).

Although our initial expectation that both awards would incentivize positive behavior was not met, we find evidence for our second pre-registered hypothesis: students who were

offered prospective awards did indeed have better attendance in February as compared to students who received a retrospective award. Students in the *Prospective Award* condition were absent 0.055 days less than students in the *Retrospective Award* condition, $SE = 0.025$, FRT $p = .024$. They were 1.7 percentage points more likely to have a perfect month of attendance, $p = .066$. But, as the above results suggest, this occurred because the retrospective award had adverse effects on student behavior.

Table 2. Average Treatment Effect (ATE) on Student Absences (“Prospective” vs. Control and “Retrospective” vs. Control)

	Absences			Perfect Attendance		
	1	2	3	4	5	6
Prospective	0.012 (0.026)	0.013 (0.025)	0.006 (0.024)	-0.012 (0.041)	-0.014 (0.043)	-0.006 (0.044)
Retrospective	0.065** (0.027)	0.065* (0.026)	0.060* (0.025)	-0.083* (0.041)	-0.090* (0.042)	-0.086* (0.043)
<i>N</i>	15,329	15,329	15,329	15,329	15,292	15,292
Control Mean	0.721	0.720	0.724	0.522	0.518	0.513
Strata	No	Yes	Yes	No	Yes	Yes
Covariates	No	No	Yes	No	No	Yes

+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Standard errors in parentheses.

Stratification variables were school and grade, controlled for as strata fixed effects.

Covariates include indicators for English Language Learner (ELL), missing ELL status and language of the letters, as well as the number of absences in the pre-study months of September, October, and November.

Columns 1-3 coefficients are point estimates from OLS regression models. The associated p-values are from FRT. Robust standard errors.

Columns 4-6 coefficients (the estimated log-odds) and associated p-values are from logit regression models.

Columns 5 & 6 have fewer participants because a handful of small randomization strata perfectly predicted the outcome variable and were therefore dropped in the regression.

Discussion

Counter to our expectations, we found no impact of offering prospective awards on subsequent attendance. We also found that offering retrospective awards for prior attendance resulted in students attending *less* school in the following month. While the increase in students' absences was thankfully small, missing 8% more days of school in a month is cause for concern.

For comparison, the most effective school attendance interventions to date only reduce absenteeism by 6-15% (e.g., Rogers & Feller, 2018; Robinson et al., 2018).

Our field experiment has two notable limitations. First, we could not test directly for the underlying mechanisms that may explain the negative effects of retrospective awards. To establish these mechanisms after the study had concluded, we needed to find an activity in a social context where people felt obligated to participate, but did not expect recognition for participating, and would have liked to participate as little as required. Second, our experiment does not provide context for how common the intervention we are studying (attendance awards) is in schools. Studies 2 and 3 address these issues.

Study 2: Exploring the Unintended Signals of Retrospective Awards

To understand why retrospective awards may have negative effects on behavior, we conducted an online experiment that would allow us to explore which unintended signals the retrospective awards may have sent to recipients.

Participants

We recruited 155 adult participants on Amazon Mechanical Turk for a study that was described as asking questions about their opinions and attitudes. 44% of the participants identified as female and the average participant was 35 years old.

Procedures & Measures

After consenting to participate in the study, the Qualtrics platform randomly assigned participants to either the control ($n = 78$) or treatment ($n = 77$) condition. First, all participants read a vignette asking them to imagine they were a 10th grader living in a suburban town in California:

Please imagine that you are a 10th grader living in a suburban town in California, near San Francisco. School started in late August. It is the end of January and you get home from school.

In the treatment condition, participants learned that they had a piece of mail waiting for them, in which they received a retrospective award for their attendance. The language of the letter mirrored that of the original field experiment and the award was designed to reflect the one actually received by students (see Figure 2).

Then, all participants read the last part of the vignette:

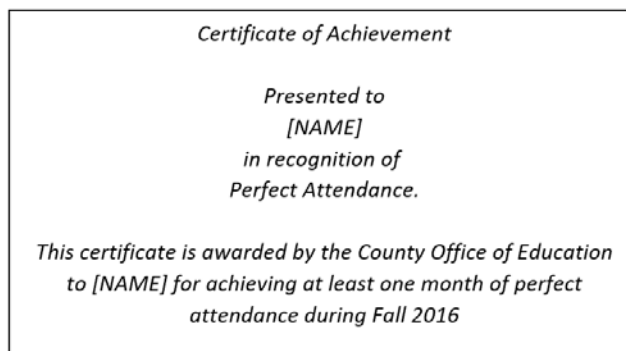
You wake up on Monday, February 1st. You're feeling tired and you forgot to do your homework for one of your classes. You have a feeling you can successfully negotiate with your parents to not attend school today.

Figure 2. Study 2 Intervention Materials

Dear [NAME],

You have earned an award for having perfect attendance! You attended school every day for one month this school year during the fall semester.

To recognize that you had zero absences for one month, we present you with the Perfect Attendance Award, enclosed with this letter. The award will not be offered again this school year.



After reading the vignette, all participants answered questions about how they thought their hypothetical absences compared to their classmates' absences, and about the school's expectations for their attendance. First, participants responded to the question, "How do you think your absences compare to those of your classmates?" Participants selected from three response options: *I had fewer absences than my classmates (I attended school more than my classmates)*, *I had about the same number of absences as my classmates (I attended school about as much as my classmates)*, and *I had more absences than my classmates (I attended school less than my classmates)*. We coded the response option *I had fewer absences than my classmates* as a 1 and the other two response options as 0.

Next, participants answered two questions about their school's expectations for their attendance: "To what extent do you think your school expected you to attend school as much as you did in the Fall?" and "To what extent do you think your school expects you to have excellent attendance moving forward?" Participants responded on a 7-point Likert scale, ranging from 1 (*My school does not expect me to have excellent attendance moving forward / My school did not expect me to attend school as much as I did*) to 7 (*My school very much expects me to have excellent attendance moving forward / My school very much expected me to attend school as much as I did*). We averaged the two items together to represent participants' perceived institutional expectations ($\alpha = 0.65$).

Results

Participants assigned to the treatment condition who learned about the retrospective award were significantly more likely to assume that they had fewer absences than their classmates (82%), as compared to participants assigned to the control group who did not learn about the award (27% assumed they had fewer absences than classmates), $\chi^2(1) = 47.1, p < .001$.

Participants in the treatment group also perceived that the school had lower expectations for their attendance ($M = 5.40$, $SE = 0.16$) than those in the control group ($M = 5.90$, $SE = 0.11$), $t(153) = 2.56$, $p = .011$, *Cohen's d* = .41.

Discussion

Study 2 provides evidence that conformity to descriptive social norms (i.e., the perception about others' attendance) and perceived low institutional expectations might be underlying mechanisms explaining why the retrospective awards decreased subsequent attendance. The results are consistent with an interpretation that the retrospective award signaled to recipients that the descriptive social norm among their peers was to attend fewer days of school than they attended. Research on descriptive social norms suggests that people tend to conform to the norm (e.g., Cialdini, 2009; Gerber & Rogers, 2009), which in this case would result in students attending school less.

The results are also consistent with an interpretation that the retrospective award signaled to recipients that their schools did not expect them to attend school as much as they did. That is, the award may be demotivating because it signaled that there were low institutional expectations for the recipient's behavior, which resonates with the conclusions from research conducted by Gubler and colleagues (2016) and Kamenica (2012). When people feel that they have exceeded the expectations for a socially desirable behavior, they may subsequently become less likely to perform the socially desirable behavior (Monin & Miller, 2001). Thus, the award may have resulted in recipients feeling allowed to miss a future day of school.

Study 3: Surveying Educational Organization Leaders

Study 3 explores two questions. First, it examines whether education leaders shared our (incorrect) intuition that retrospective attendance awards would increase attendance. And second,

it examines how widespread the practice of offering symbolic awards is in the organizational setting in which Study 1 occurs, schools.

Participants

We recruited 188 school leaders and educators at a learning session organized by a large, urban district to complete a survey in October 2017. In this session, the research team's goal was to encourage as many attending participants as possible to complete the survey (the district estimated that about 200 people would attend this session). Of the 188 practitioners who completed the survey, 147 were members of school leadership (e.g., principals, assistant principals, etc.), 30 were teachers in leadership positions, 9 were non-teaching staff, and 2 did not respond. 63 participants indicated that they worked in middle or high school settings, while 125 participants worked only in elementary school settings.

We also recruited teachers from across the United States on Amazon Mechanical Turk to complete the same version of the survey online in October 2017, which resulted in 119 valid teacher participants. 45 teachers reported working in middle and high school settings and the remainder worked in elementary school settings.

Procedures & Measures

Participants in the district learning session received a paper-based survey while teachers completing the survey on Amazon Mechanical Turk took an online survey. Otherwise, the survey details were the same. Participants first consented to participating in the survey and then responded to the survey questions.

First, we described the retrospective award and asked if they thought it would result in award winning students attending school more, the same, or less than if they did not receive the award. Specifically, participants read and responded to the following question: "We are

considering providing students with awards to encourage good attendance. Do you think providing students with an award in January for having had perfect attendance during at least one fall month (Sept, Oct, or Nov) will result in students attending school more, the same, or less in February than if they did not receive the award?” Participants selected from three response options: *Students who receive the award will attend school MORE (improved attendance)*, *Students who receive the award will attend school THE SAME AMOUNT (no impact)*, or *Students who receive the award will attend school LESS (decreased attendance)*.

Next, we assessed the ubiquity of offering awards for student attendance. The second question asked, “Do any teachers, administrators, or staff in your school offer recognitions or awards for positive student attendance?” Participants selected either *Yes* or *No*.

For both surveys, we pre-registered the following two hypotheses before looking at the outcome data (Robinson & Rogers, 2017a; 2017b):

- Hypothesis 1: Educators will predict that providing students with an award in January for having had perfect attendance during at least one fall month will result in students attending school more or the same, as compared to less.
- Hypothesis 2: The majority of educators will report that teachers, administrators, or staff in their school offer recognition or awards for positive student attendance.

We indicated that we would evaluate these hypotheses using chi-squared goodness of fit tests comparing whether the observed proportions differ from the expected proportions.

Results

As hypothesized, only a small fraction of educators correctly predicted that retrospective awards would disincentivize subsequent attendance. Only 2% of district educators and 2% of

teachers predicted that providing students with a retrospective award would result in students attending school less, $\chi^2(1) = 82.3$ and $\chi^2(1) = 53.6$, respectively, $ps < .001$.

We also find evidence supporting our second hypothesis; i.e., that the majority of schools do indeed offer recognition or awards for positive student attendance. 95% of educators in the urban district and 57% of teachers reported that someone in their school offered awards for student attendance, $\chi^2(1) = 149.1$, $p < .001$ and $\chi^2(1) = 2.17$, $p = .14$, respectively.

Discussion

Study 3 demonstrates that most schools use awards to motivate students' attendance, and that school leaders believe these awards are effective. This widespread practice contrasts with Study 1's results regarding prospective awards – which had no net effect – as well as retrospective awards – which had a negative net effect. We note three limitations to the survey questions used in this study. First, it asked about the prevalence of awards, in general, and not specifically the prevalence of retrospective or prospective awards. Second, it did not specifically ask about surprise awards, which was a feature of the retrospective awards offered in Study 1. Finally, it did not ask about purely symbolic awards as opposed to material awards. Material awards to increase attendance (e.g., a \$700 iPad) may be potent, but not because they are “awards” as such, rather because they are material incentives to increase attendance.

General Discussion

In contrast to our prediction that both prospective and retrospective awards would improve recipients' subsequent behavior, we find that prospective awards did not impact behavior and retrospective awards unexpectedly demotivated the target behavior. When students earned an unexpected retrospective award for positive prior attendance, they attended 8% fewer days of school in the following month. Our survey experiment exploring the possible mechanisms behind this negative effect suggest that the retrospective awards may have sent

unintended signals to recipients: that recipients are performing better than the descriptive social norm of their peers, and that they are exceeding the institutional expectations for the awarded behavior. To gauge the practical relevance of these findings, we surveyed field experts and found that most leaders and practitioners reported using awards to motivate attendance, and almost none had an intuition that retrospective awards could demotivate the target behavior.

These findings have implications for when and how awards should be used to motivate desirable behaviors – and when they may backfire. These boundary conditions have so far received only limited attention in the literature on organizational awards (see Gallus & Frey, 2016). Our results should be of interest to the myriad organizations and leaders using awards, as they not only show that awards may have unintended effects on their recipients' behavior; they also point out mechanisms to be considered, notably the signals – intended and unintended – that can be emitted by the use of awards.

References

- Angrist, J., & Lavy, V. (2009). The effects of high stakes high school achievement awards: Evidence from a randomized trial. *American Economic Review*, 99(4), 1384-1414.
- Assembly Bill No. 2815 (September 29, 2016).
- Ashraf, N., Bandiera, O., & Lee, S. (2014). Awards unbundled: Evidence from a natural field experiment. *Journal of Economic Behavior and Organization*, 100, 44-63. doi:10.1016/j.jebo.2014.01.001
- Athey, S., & Imbens, G. (2016). The econometrics of randomized experiments. *arXiv preprint arXiv:1607.00698*.
- Balfanz, R., & Byrnes, V. (2012). *Chronic Absenteeism: Summarizing What We Know From Nationally Available Data*. Baltimore: Johns Hopkins University Center for Social Organization.
- Bénabou, R., & Tirole, J. (2003). Intrinsic and extrinsic motivation. *Review of Economic Studies*, 70(3), 489-520. doi:10.1111/1467-937X.00253
- Blanes i Vidal, J., & Nossol, M. (2011). Tournaments without prizes: Evidence from personnel records. *Management Science*, 57(10), 1721-1736.
- Bradler, C., Dur, R., Neckermann, S., & Non, A. (2016). Employee Recognition and Performance: A Field Experiment. *Management Science*, 62(11), 3085-3099.
- Bursztyn, L., & Jensen, R. (2015). How Does Peer Pressure Affect Educational Investments? *Quarterly Journal of Economics*, 130(3), 1329-1367.
- Chan, H. F., Frey, B. S., Gallus, J., & Torgler, B. (2014). Academic honors and performance. *Labour Economics*, 31, 188-204. doi:10.1016/j.labeco.2014.05.005
- Cialdini, R. B. (2009). *Influence: Science and practice*. New York: William Morrow.
- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research*, 71(1), 1-27.
- Every Student Succeeds Act. (2015). *Every Student Succeeds Act of 2015, Pub. L. No. 114-95 § 114 Stat. 1177 (2015-2016)*.
- Fagnani, S. (2018). "Recognition Ideas to Reward Employees for Perfect Attendance." Small Business - Chron.com, <http://smallbusiness.chron.com/recognition-ideas-reward-employees-perfect-attendance-10030.html>. Accessed 09 July 2018.
- Flory, J. A., Leibbrandt, A., & List, J. A. (2016, June). *The Effects of Wage Contracts on Workplace Misbehaviors: Evidence from a Call Center Natural Field Experiment*. Working Paper. (22342). National Bureau of Economic Research.
- Frey, B. S. (2007). Awards as compensation. *European Management Review*, 4(1), 6-14. doi:10.1057/palgrave.emr.1500068

- Frey, B. S., & Gallus, J. (2017). *Honours versus Money: The Economics of Awards*. Oxford: Oxford University Press.
- Gallus, J. (2017). Fostering public good contributions with symbolic awards: A large-scale natural field experiment at Wikipedia. *Management Science*, 63(12), 3999-4015.
- Gallus, J., & Frey, B. S. (2016). Awards: A strategic management perspective. *Strategic Management Journal*, 37(8), 1699-1714. doi:10.1002/smj.2415
- Gallus, J., & Frey, B. S. (2017). Awards as strategic signals. *Journal of Management Inquiry*, 26(1), 76-85. doi:10.1177/1056492616658127
- Gallus, J., & Heikensten, E. (2018). *Using awards to overcome self-stereotyping in knowledge workers*. Working Paper.
- Garr, S. (2012). *The State of Employee Recognition in 2012*. Oakland, CA: Bersin and Associates.
- Gerber, A. S., & Rogers, T. (2009). Descriptive Social Norms and Motivation to Vote: Everybody's Voting and so Should You. *The Journal of Politics*, 71(1), 178-191.
- Gilchrist, D. S., Luca, M., & Malhotra, D. K. (2016). When $3 + 1 > 4$: Gift Structure and Reciprocity in the Field. *Management Science*, 62(9), 2639-2650.
- Gneezy, U., & List, J. A. (2006). Putting Behavioral Economics to Work: Testing for Gift Exchange in Labor Markets Using Field Experiments. *Econometrica*, 74(5), 1365-1384. doi:10.1111/j.1468-0262.2006.00707.x
- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and why incentives (don't) work to modify behavior. *Journal of Economic Perspectives*, 25(4), 191-209.
- Gneezy, U., & Rustichini, A. (2000). A fine is a price. *Journal of Legal Studies*, 29, 1-17.
- Goetzel, R. E. (2004). Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *Journal of Occupational and Environmental Medicine*, 46(4), 398-412.
- Gubler, T., Larkin, I., & Pierce, L. (2016). Motivational spillovers from awards: Crowding out in a multi-tasking environment. *Organization Science*, 27(2), 286-303. doi:10.2139/ssrn.2215922
- Guryan, J., Christenson, S., Claessens, A., Engel, M., Lai, I., Ludwig, J., . . . Turner, M. C. (2017). The Effect of Mentoring on School Attendance and Academic Outcomes: A Randomized Evaluation of the Check & Connect Program. *Northwestern Institute for Policy Research: Working Paper Series*.
- Holmström, B., & Milgrom, P. (1991). Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design. *Journal of Law, Economics, and Organization*, 7(Special Issue), 24-52.

- Hoogveld, N., & Zubanov, N. (2017). The power of (no) recognition: Experimental evidence from the university classroom. *Journal of Behavioral and Experimental Economics*, 67, 75-84.
- Huberman, B. A., Loch, C. H., & Öngüler, A. (2004). Status as a valued resource. *Social Psychology Quarterly*, 67(1), 103-114.
- Jones, D., & Linardi, S. (2014). Wallflowers: Experimental evidence of an aversion to standing out. *Management Science*, 60(7), 1757-1771. doi:10.1287/mnsc.2013.1837
- Kamenica, E. (2012). Behavioral economics and psychology of incentives. *Annual Review of Economics*, 4(1), 427-452.
- Kosfeld, M., & Neckermann, S. (2011). Getting more work for nothing? Symbolic awards and worker performance. *American Economic Journal: Microeconomics*, 3(3), 86-99. doi:10.1257/mic.3.3.86
- Larkin, I. (2011). *Paying \$30,000 for a Gold Star: An empirical investigation into the value of peer recognition to software salespeople*. Unpublished working paper.
- Lazear, E. P. (2000). Performance pay and productivity. *American Economic Review*, 90(5), 1346-1361.
- Lazear, E. P., & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy*, 89(5), 841-864.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic rewards: A test of the over-justification hypothesis. *Journal of Personality and Social Psychology*, 28(1), 129-137.
- Levitt, S. D., List, J. A., Neckermann, S., & Sadoff, S. (2016). The behavioralist goes to school: Leveraging behavioral economics to improve educational performance. *American Economic Journal: Economic Policy*, 8(4), 183-219.
- Lourenço, S. M. (2016). Monetary Incentives, Feedback, and Recognition: Complements or Substitutes? Evidence from a Field Experiment in a Retail Services Company. *Accounting Review*, 91(1), 279-297.
- Malmendier, U., & Tate, G. (2009). Superstar CEOs. *Quarterly Journal of Economics*, 124(4), 1593-1638. doi:10.1162/qjec.2009.124.4.1593
- Markham, S. E., Scott, K. D., & McKee, G. H. (2002). Recognizing good attendance: A longitudinal quasi-experimental field study. *Personnel Psychology*, 55(3), 639-660.
- Monin, B., & Miller, D. T. (2001). Moral credentials and the expression of prejudice. *Journal of Personality and Social Psychology*, 81(1), 33.
- Neckermann, S., & Yang, X. (2017). Understanding the (unexpected) consequences of unexpected recognition. *Journal of Economic Behavior and Organization*, 135, 131-142.
- Robinson, C. D., Lee, M. G., Dearing, E., & Rogers, T. (2018). Reducing Student Absenteeism in the Early Grades by Targeting Parental Beliefs. *American Educational Research Journal*, 26(3), 353-383.

- Robinson, C. D., & Rogers, T. (2017a, October 15). Retrospective Awards - School Leader Survey. Retrieved from osf.io/ks8fr
- Robinson, C. D., & Rogers, T. (2017b, October 19). Retrospective Awards - Teacher Survey. Retrieved from osf.io/qe7d9
- Rogers, T. (2016, June 3). Attendance Matters 6-12. Prospective vs Retrospective Symbolic Awards. Retrieved from osf.io/rgbd3
- Rogers, T., & Feller, A. (2018). Reducing student absences at scale by targeting parents' misbeliefs. *Nature Human Behaviour*.
- Springer, M. G., Rosenquist, B. A., & Swain, W. A. (2015). Monetary and Nonmonetary Student Incentives for Tutoring Services: A Randomized Controlled Trial. *Journal of Research on Educational Effectiveness*, 8, 453–474.
- Tran, A., & Zeckhauser, R. (2012). Rank as an inherent incentive: Evidence from a field experiment. *Journal of Public Economics*, 96(9), 645-650.

Supplementary Materials

Table S1. Average Treatment Effect (ATE) on Student Absences (Pooled Treatments “Prospective” and “Retrospective” vs. Control)

	Absences			Perfect Attendance		
	1	2	3	4	5	6
Treatment pooled	0.038 (0.023)	0.039 ⁺ (0.022)	0.033 (0.021)	-0.048 (0.035)	-0.053 (0.037)	-0.046 (0.038)
<i>N</i>	15,329	15,329	15,329	15,329	15,292	15,292
Control Mean	0.721	0.720	0.724	0.522	0.518	0.513
Strata	No	Yes	Yes	No	Yes	Yes
Covariates	No	No	Yes	No	No	Yes

⁺ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Standard errors in parentheses.

Stratification variables were school and grade, controlled for as strata fixed effects.

Covariates include indicators for English Language Learner (ELL), missing ELL status and language of the letters, as well as the number of absences in the pre-study months of September, October, and November.

Columns 1-3 coefficients are point estimates from OLS regression models. The associated p-values are from FRT. Robust standard errors.

Columns 4-6 coefficients (the estimated log-odds) and associated p-values are from logit regression models.

Columns 5 & 6 have fewer participants because a handful of small randomization strata perfectly predicted the outcome variable and were therefore dropped in the regression.