Cash (Dis)Incentives

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Common wisdom and academic theories suggest that incentives can motivate behavior change. While considerable research has focused on financial incentives as a default tool to encourage desired outcomes, less is known about the efficacy of monetary (cash-based) compared to nonmonetary incentives in shaping behavior. The present research investigates the psychology and consequences of cash incentives for individuals’ choices, motivation, and behavior. Results from eight study series indicate that cash incentives evoke a “compensation mindset” that focuses consumers on the outcome of attaining the reward rather than the process of expending effort, leading them to prioritize maximizing the chances and immediacy of receiving a focal reward. Compared with noncash hedonic rewards of equivalent retail value, consumers facing contingent cash incentives were more likely to: choose smaller-certain and smaller-immediate rewards over larger-uncertain and larger-delayed rewards (respectively); settle for easier performance goals and tasks; and cheat more to secure compensation. Combined, these findings suggest that managers and marketers seeking to motivate their constituents may do well to reconsider the use of cash incentives.

*Keywords:* behavior change, incentives, monetary rewards, motivation, reward programs
Designing cost-effective incentives to motivate desired behaviors and healthy habits is a central area of interest for academics, executives, and policymakers. Consistent with a fundamental theme of economics, customers, employees, salespeople, managers, and even animals respond to incentives. A vast literature on incentives with respect to motivation and self-control has accumulated in the past several decades, attracting a swath of interdisciplinary perspectives from economics and marketing to organizational behavior, psychology, philosophy, political science, and behavior therapy (see, e.g., Bonner and Sprinkle 2002; Jenkins, Jr. et al. 1998). To the extent that incentives are employed as a tool for behavior change, the prevailing practice among scholars and practitioners has been to study and rely largely on monetary rewards to alter human decision making and performance.

In contrast to the considerable amount of literature on the effects of financial compensation, research examining the psychological and behavioral effects of cash relative to noncash rewards is comparatively sparse. The current research investigates the consequences and limitations of monetary (cash) incentives in motivating individuals’ choices and behaviors. In particular, we contrast cash incentives with noncash (hedonic) rewards (and with unrewarded control conditions) in both hypothetical choices and real-effort tasks with consequential incentives. Our empirical findings indicate that offering cash in return for effort tends to induce a “compensation mindset” that shifts priorities toward the outcome of receiving payoff and away from the process of engaging in the effort task: People become focused on ensuring, and avoiding any delay in, their reward. Moreover, cash incentives and the compensation mindset they evoke drive people to exhibit more cheating or dishonest behavior under effortful settings in order to guarantee compensation for their efforts.
The rest of this article is organized as follows: First, we discuss relevant literature on monetary incentives, including their psychological and motivational effects. We proceed to develop a theory of how cash incentives (vs. noncash rewards or no-incentive controls) evoke a compensation mindset that shifts preferences and behavior toward riskless, immediate, and easier options. Eight series of studies present evidence of such a compensation mindset and its demotivating effects. We conclude by discussing the implications of this compensation-driven psychology underlying monetary incentives for consumer motivation, self-control, and welfare.

**CONCEPTUAL DEVELOPMENT**

*The Ubiquity of Monetary Incentives*

When engineering tools to change human decisions and behavior, a customary (and usually default) approach, reflected in both economic theory and industry practice, has appealed to monetary incentives as impetus. A wealth of interventions rely on financial remuneration to encourage good habits or curb bad ones (for a review, see Gneezy, Meier, and Rey-Biel 2011), whether it be paying people to go to the gym (Charness and Gneezy 2009), improve academic performance (Levitt, List, and Sadoff 2016), or boost worker productivity (Lazear 2000; Prendergast 1999).

Despite the many benefits conferred by monetary incentives (among them fungibility and flexibility), multiple streams of research suggest that cash incentives carry some disadvantages. The experimental economics literature has uncovered somewhat mixed results on the efficacy of cash incentives in motivating individuals’ behavior with respect to both short-run improvement and long-term performance (Gneezy et al. 2011). Many financial-based interventions have found little success in generating sustained effects, causing any gains accumulated in the short run to
evaporate once incentives are withdrawn (e.g., John et al. 2011), although debate persists on the extent and magnitude of these post-reward effects (Goswami and Urminsky 2017; see also Kivetz, Urminsky, and Zheng 2006).

In marketing, mixed results have surfaced regarding whether deals, discounts, and price promotions are invariably effective or instead may decrease brand loyalty (e.g., DelVecchio, Henard, and Freling 2006; Dodson, Tybout, and Sternthal 1978). Other documented anomalies in the success of incentive systems (for a review, see Kamenica 2012) include counterproductive effects when an agent offers financial rewards for prosocial behavior, provides too many options, and pays too much or too little. Finally, Read (2005) cautions against requiring the use of real (monetary) incentives in experimental economics and psychology, as they do not always guarantee the desired effects above those obtained in hypothetical studies.

One line of work has investigated some psychological consequences of exposure to money and monetary prospects. For example, activating the concept of money may potentially shift behavior and the nature of social interactions and relationships (Fiske 1991), rendering people more self-sufficient, less altruistic, and more likely to endorse free-market values (Caruso et al. 2013; Vohs, 2015; but cf. some work questioning the reliability of money-priming effects, e.g., Rohrer, Pashler, and Harris 2015). Other research on the affective psychology of risk contrasts valuations of monetary with nonmonetary outcomes (e.g., a gamble consisting of losing $50 vs. incurring an electric shock) and suggest that the former, being less “affect-rich,” makes people more sensitive to changes in probability within the extremes of certainty and impossibility (McGraw, Shafir, and Todorov 2010; Pachur, Hertwig, and Wolkewitz 2014; Rottenstreich and Hsee 2000) and to variations in scope (Hsee and Rottenstreich 2004). Rather than activate concepts of money or focus on people’s joint evaluations of monetary versus nonmonetary
prospects, the current research compares various motivational effects of cash incentives relative to similarly extrinsic hedonic rewards (and relative to unrewarded controls) under scenarios and settings where consumers must (or are expected to) expend effort.

*The Value of Noncash Rewards*

Although ample research has examined incentive systems predicated on financial compensation, direct comparisons of the effects of monetary incentives and tangible, nonmonetary rewards on shaping decisions and behaviors remain scarce. Noncash rewards merit further examination for several reasons. First, such motivators are frequently deployed in the marketplace and workforce. Rather than offering higher pay for better performance, companies often offer prizes in the form of travel packages, restricted-use gift cards, products and services, and other benefits (*e.g.*, Culpepper and Associates 2008; Famulari and Manser 1989; Kivetz and Simonson 2002a; Kivetz, Urminsky, and Zheng 2006). Eighty-three percent of firms in one survey reported using rewards such as merchandise or travel items with their sales personnel (Incentive Federation 2005), and 55% of participants in another survey pointed to noncash awards as a “vital component of sales performance management” (Aberdeen Group 2013).

Second, beyond their widespread use, noncash rewards can possess an advantage over their monetary counterparts in a variety of circumstances, both at an individual and situational level. When asked to explicitly choose between the two, a substantial segment of consumers—*hyperopic* individuals who feel a need to “precommit” to indulgences—prefer hedonic rewards to cash incentives of equal or greater value (Kivetz and Simonson 2002b). Further, because many people perceive choosing, acquiring, and consuming luxuries as more guilt-invoking and harder to justify (Dhar and Wertenbroch 2012; Kivetz and Simonson 2002b; Okada 2005; Prelec and Herrnstein 1991), the presence of greater effort requirements in reward programs tends to justify and enhance choices of noncash hedonic rewards over cash-equivalent incentives (Kivetz
and Simonson 2002a). Kivetz and Zheng (2017) demonstrate that the greater need to justify hedonic (vs. utilitarian) consumption means that promotions have a greater positive influence on purchase likelihood of hedonic luxuries compared to necessity products. Drawing on this asymmetric justification effect, Jeffrey (2009) found in one study that tangible prizes (e.g., a 5-minute massage coupon valued at $10) caused participants in a laboratory study to improve by more points on a word game task relative to equivalent cash awards (e.g., $10).

**How Cash Can Disincentivize Behavior**

Why do monetary incentives sometimes fail or backfire, in contrast to other (noncash) forms of reward? Several major mechanisms govern when cash becomes a disincentive. First, research in both psychology and economics suggests that extrinsic incentives can sometimes undermine, or “crowd out,” intrinsic motivation (e.g., Bénabou and Tirole 2003; Deci 1971; Deci, Koestner, and Ryan 1999; Frey and Oberholzer-Gee 1997; Higgins et al. 1995; Kivetz 2005; Kruglanski, Friedman, and Zeevi 1971; Lepper, Greene, and Nisbett 1973). To the extent that a person derives no reward except for the activity itself, s/he is said to be intrinsically motivated in performing that activity. The “crowding out” (or “overjustification”) effect reported in this literature occurs when individuals attribute their interest in the focal activity to an external source (e.g., “cold, hard cash” or the threat of punishment) rather than to inherent pleasure or meaning from pursuing the activity. In a classic experiment, Deci (1971) observed that undergraduates in the laboratory spent less free time working on interesting puzzles when they had been temporarily paid $1 per puzzle in a previous session than when they solved them for free.

Using a principal-agent model to formally quantify the hidden costs of extrinsic incentives, Bénabou and Tirole (2003) offer a contract theory view of crowding-out phenomena
that seeks to reconcile the psychological and economic perspectives. The authors posit that under asymmetric information (in which the principal is privately informed about the task or the agent’s talent and the agent is unsure about his ability to perform a task), rewards are weak positive reinforcers of performance in the short term and negative reinforcers in the long term. Since the principal might reasonably offer more compensation for less pleasant tasks, uninformed agents may infer bad news from the presentation of high-powered incentives, either about the focal task or their own ability. The reduction of intrinsic motivation when facing incentive schemes in such contexts would be quite rational per this analysis.

Building on reactance theory and overjustification effects, Kivetz (2005) found that consumers prefer rewards that are congruent with (i.e., related to) the required consumption effort as a means of coping with their reactance to loyalty programs and other marketing promotions. Choosing effort-congruent rewards (e.g., earning a music CD for reviewing songs) reaffirms autonomy by enabling individuals to perceive their actions as intrinsically motivated rather than externally influenced. Given such preferences for effort-reward congruity, incentive systems that feature cash may therefore be especially demotivating, as cash represents the ultimate reward denominated in a different currency than any effort or consumption.

In addition to explanations based on overjustification or inferences and signaling, a number of other contextual features of the decision environment (e.g., default options and framing effects), may promote counterproductive results in the presence of monetary incentives. Kamenica (2012) reviews several instances in which “standard” incentives can backfire from their intended effect, while interventions that leverage choice architecture work. He argues, for example, that in some cases nonstandard preferences such as loss aversion explain why people do not react to monetary incentives in expected ways, as when they treat a default alternative as
their reference outcome (e.g., Thaler 1980). In other cases, because incentive schemes can affect the technology of production, paying too much can cause people to “choke” under pressure.

Another interpretation of crowding-out effects is that cash incentives may change how people fundamentally encode the value attached to effort expenditure in pursuit of a goal or task. Specifically, denomoting incentives in cash may be more likely to focus people on securing an outcome as opposed to—and at the expense of—undergoing the process of an effortful activity. As a result, an individual facing the prospect of earning cash will tend to care more about, or attend more to the prospect of, merely attaining the reward as opposed to rightfully earning it.

Previous research on goal setting and self-regulation has distinguished the influence of outcome goals from process goals on performance. For example, Zimmerman and Kitsantas (1999) gave high school girls the task of combining a series of kernel sentences into a single nonredundant sentence. Those assigned to an outcome goal (focus on minimizing the number of words in the combined sentence) performed worse in their post-test writing revision skill compared to those assigned to adhere to a process goal (focus on a 3-step method for combining sentences). In one intervention conducted on obese adults using financial incentives for weight loss, emphasizing the goal of the desired outcome (to lose weight) led to less weight loss improvements compared to emphasizing the goal of the desired effort or behavior (to eat healthily; Mahoney 1974). Referring to extrinsic incentives, Condry and Chambers (1978, p. 66) posited that “rewards often distract attention from the process of task activity to the product of getting a reward.” This literature, however, has tended to compare the effects of monetary incentives against unrewarded controls; direct comparisons of the relative effects of cash compared to noncash (e.g., hedonic yet similarly extrinsic) rewards in altering behavior remain understudied.
Consistent with this last account centered around outcome- versus process-focused thinking, the empirical evidence we present below suggests that in shifting consumers’ focus toward the desired outcome (rather than the underlying process) of effort expenditure, monetary incentives evoke what we call a compensation mindset. By this, we refer to a preoccupation with the outcome of attaining a reward (e.g., by securing desired and immediate returns) at the expense of investing effort in a focal task or activity. Such a mindset is illustrated by the expression “getting the most bang for the buck,” an idea that encompasses both maximizing expected outcomes (outputs) while simultaneously minimizing effort expenditure (inputs). Although several manifestations of a compensation mindset may exist, in this article we focus on two key general domains relevant to motivation: (i) intrapersonal tradeoffs between a more “virtuous” but costly (in terms of added risk or time delay) option and a more “vice-ridden” but tempting option (i.e., choices involving probabilistic and delayed rewards); and (ii) cheating behaviors. Whereas the first research area examines the effect of cash (vs. hedonic but similarly extrinsic) incentives on preferences for incentive structures that promise certainty, immediacy, and ease, the second domain investigates how incentivizing people with cash (as opposed to with hedonic rewards or unrewarded controls) when engaging in real-effort tasks can skew actions toward taking an “easier way out” by cheating more to receive the incentive.

Following the above logic, people who are asked to exercise in exchange for cash may expect and desire a short and certain path by which to obtain the prize. Rather than opt for larger effort-contingent rewards that are either probabilistic or require waiting longer, they are likely to become more attracted to smaller and easier cash amounts that promise certainty and immediacy. Further, when receipt of the cash is not guaranteed or is contingent on exerting considerable effort, the same individuals may even resort to less ethical means of accomplishing the focal goal.
precisely because the outcome of expending effort (i.e., getting the incentive) is viewed as more important than the effort stream itself.

In sum, building on research on overjustification effects and other contextual factors that may be responsible for transforming cash into a “disincentive,” the findings we report highlight the role played by an asymmetric attention to the outcome of (rather than the process behind) effort exertion toward a given goal or task. Such an account may help us further understand why individuals often respond in counterproductive ways to the provision of cash incentives.

**OVERVIEW OF STUDIES**

We tested our propositions in several studies that compare the effects of cash against noncash rewards in shaping choices and behavior. Eight sets of studies provide convergent evidence that implicates a compensation mindset when individuals encounter cash (vs. noncash hedonic) contingent rewards. Study series 1 and 2 investigated how consumers make tradeoffs between the magnitude of a reward and its risk and delay, respectively, as a function of the type of rewards (monetary or nonmonetary) that consumers face. Prior work suggests that the preference for immediacy in intertemporal choice and the preference for certainty in risky choice are connected (e.g., Mischel and Grusec 1967; Prelec and Loewenstein 1991; Rotter 1954; see also Urminsky and Kivetz 2011); we therefore analyze decisions under both paradigms.

Specifically, we found that contingent cash incentives, relative to noncash (but extrinsic) hedonic prizes of equivalent monetary value, led participants to: choose programs offering a certain but smaller (vs. uncertain but larger) reward (studies 1a-1c); set lower performance goals and select easier tasks (studies 1d-1g); and opt for programs offering an immediate but smaller (vs. delayed but larger) reward (studies 2a-2b). The next two series of studies identified two
factors under which these preferences are less likely to hold: the withdrawal of effort contingency (studies 3a-3b) and the removal of absolute certainty or immediacy in gaining a focal reward (studies 4a-4b). Studies 5, 6, and 7 further examined a consequence of the compensation mindset in the form of cheating and dishonest behavior. Across three different incentivized, real-effort paradigms, people cheated more when they faced the prospect of earning cash as opposed to noncash, hedonic rewards for exceeding a given performance threshold (as well as compared to unrewarded control). Despite these revealed behaviors, people overwhelmingly stated that they preferred incentive programs whose rewards are denominated in cash (vs. hedonic prizes) and believed (or projected) them to be more motivating.

The studies reported herein feature responses from paid U.S. workers recruited from Amazon Mechanical Turk (MTurk) with at least a 96% approval rating. We excluded data from those who failed an attention check, although the results throughout are robust to their inclusion.

**STUDY SERIES 1: CASH INCENTIVES ENHANCE PREFERENCE FOR GUARANTEED REWARDS**

According to our conceptual framework, a key aspect of a compensation mindset is the expectation of receiving something “for sure” in return for expending effort. Accordingly, study series 1 tests the hypothesis that when people are offered cash payments as opposed to nonmonetary (e.g., hedonic) rewards as an incentive for meeting a specified performance level or goal, they are more likely to prefer guaranteed incentives—even at the cost of lower earnings.

To capture how consumers trade off the magnitude and probability of a reward, we used a risky choice paradigm where participants chose between two programs (presentation order counterbalanced) intended to increase their daily walking activity: (i) Program A, featuring a certain but smaller reward; and (ii) Program B, featuring an uncertain but larger reward. The
incentives were framed either in monetary (i.e., cash) or in hedonic terms (i.e., as a gift catalog consisting of 11 hedonic items, from which participants could select one prize, each with retail value equivalent to the cash incentive). These items, selected based on responses from a pretest, included rewards such as a gift card to Starbucks Coffee, a box of gourmet chocolates, a gift card to an AMC movie theater, and a Groupon “Spa Day” gift card (see web appendix A).

**Study 1a: Exercise Incentive Programs**

*Procedure.* Participants consisted of 327 respondents randomly assigned to either a monetary incentive or hedonic incentive condition. As part of a “Preferences and Evaluations” survey, participants were asked to choose which of two exercise programs they preferred to join. Both programs lasted four weeks and encouraged members to walk at least 60,000 steps each week. For each week a member met or exceeded the target goal of 60,000 steps, s/he would earn an incentive denominated in either a cash (i.e., in the monetary incentive condition) or a noncash currency (i.e., in the hedonic incentive condition).

Participants assigned to the monetary incentive condition read about Program A, which offered a smaller but certain reward ($5 in cash), followed by Program B, which offered a larger but uncertain reward (entry into a raffle with a 1 in 20 chance to earn $100 in cash). For those assigned to the hedonic incentive condition, the smaller but certain reward consisted of the participant’s choice of one smaller item (with retail value of $5) from a predetermined gift catalog, while the larger but uncertain reward consisted of an entry into a raffle with a 1 in 20 chance of earning the participant’s choice of one larger hedonic reward (with retail value of $100) from the same gift catalog. We counterbalanced the order of presentation of these two programs. As the primary dependent measure, we asked participants to choose the program they would rather join, assuming they could only enroll in one.
Results and discussion. Presentation order did not affect choice shares (χ²(1) = 1.76, p = .19) or interact with incentive condition to affect choice shares (χ²(1) = .19, p = .66). Thus, we report the rest of the findings collapsed across presentation order. Consistent with risk aversion, participants in both incentive conditions were more likely to choose the program offering the smaller-certain (over larger-uncertain) reward (80% monetary, χ²(1) = 59.40, p < .001; 69% hedonic, χ²(1) = 23.73, p < .001). However, this tendency to prefer the smaller-certain (vs. larger-uncertain) reward was stronger among those in the monetary condition compared to those in the hedonic condition (χ²(1) = 5.09, p = .02), suggesting that cash incentives prompt a greater “stickiness” toward incentives that are guaranteed (despite earning a smaller amount).

Studies 1b: Foreign Language Incentive Programs

Study 1b (N = 356) tested whether cash incentives shift preferences toward smaller but guaranteed rewards using a different scenario of required effort and program goal (see web appendix B for methodological details). Participants chose between two language programs that offered a bonus based on members’ performance on an exam (denominated in either a cash or hedonic currency, as in study 1a). The tendency to prefer the smaller-certain (vs. larger-uncertain) reward was again stronger among those in the monetary condition compared to those in the hedonic incentive condition (77% vs. 68%; χ²(1) = 3.60, p = .06).

Study 1c: Exercise Incentive Programs with a Greater Expected Value for the Uncertain Reward

The previous two studies both featured reward options whose expected values were equivalent ($5 in each case). Study 1c (N = 230) followed the same procedure as study 1a but increased the expected value of the larger-uncertain reward such that it exceeded that of the smaller-certain reward (i.e., a 1 in 20 chance to earn $120, instead of $100, in either cash or hedonic terms; see web appendix C). We found the same pattern: Participants assigned to the
monetary (vs. hedonic) incentive condition were more likely to choose the smaller-certain reward over the larger reward, uncertain reward, thereby sacrificing expected value in order to guarantee “compensation” (75%_{monetary} vs. 62%_{hedonic}; \chi^2(1) = 4.97, p = .026).

Study 1d: Choosing “Safer” Goals

Studies 1a through 1c provide convergent evidence that relative to noncash hedonic rewards, cash incentives enhance preference for guaranteed (but lower magnitude) contingent rewards over probabilistic (but higher magnitude, and even higher expected value) rewards. Does assigning a more challenging, effortful goal required to earn a reward operate similarly as imposing uncertainty in the reward itself (as we did previously when the uncertain reward consisted of entry into a lottery)? To test this, study 1d instantiated reward uncertainty by framing the tradeoff between reward magnitude and probability in terms of the effort expenditure required to earn the reward.

Procedure. Participants consisted of 178 respondents assigned to either a monetary or a hedonic incentive condition. Participants chose between two exercise incentive programs in their area (following the same scenario used in study 1a). In the monetary incentive condition, participants chose between Program A, which offered a smaller reward ($5 in cash) for meeting a relatively easier weekly step goal (30,000 steps), and Program B, which offered a larger reward ($10 in cash) for meeting a relatively harder weekly step goal (75,000 steps). Participants in the hedonic incentive condition saw the same information except that they were offered their choice of a hedonic item (with equivalent retail value) from a gift catalog. Although both exercise programs feature contingent rewards that are non-probabilistic in nature (in contrast to the raffle entry options in studies 1a-1c), meeting the 30,000-step requirement of Program A is considerably easier and more feasible (if not guaranteed) than is meeting the 75,000-step
requirement of Program B—an assumption we corroborated in a separate posttest (see web appendix D). Hence, consumers should be more likely to view Program A’s incentive as smaller but essentially certain and Program B’s incentive as larger yet relatively more uncertain.

Results and discussion. Whereas 56% of participants in the monetary incentive condition chose the program with the smaller reward but easier step goal over the program with the larger reward but harder goal, only 36% of those in the hedonic incentive condition did so ($\chi^2(1) = 7.20, p = .007$). The effect of incentive currency on choice indicates that, consistent with the findings from studies 1a through 1c, cash incentives induce a preference for rewards that are guaranteed by virtue of being easy to obtain. Effectively, such behavior amounts to choosing “safer” options that award lower earnings for accomplishing less challenging tasks.

Study 1e: Setting “Safer” Goals (Open-ended)

Procedure. Study 1d’s results indicate that cash incentives shift choices toward incentive contracts that are considered safer in the sense of ensuring receipt of the effort-contingent reward. Study 1e extends this idea by explicitly asking participants to state a target goal that would determine whether they receive the focal reward. One hundred and sixty-three (163) participants, randomly assigned to either a monetary incentive or a hedonic incentive condition, considered a month-long exercise incentive program in their area that encouraged members to walk “a certain number of steps each week that they set for themselves at the beginning.” The program offered members a reward for meeting their self-specified target step goals; this reward consisted of $5 denominated in either cash or hedonic currency corresponding to the incentive condition. As the dependent measure, participants indicated, using an open-ended question, a weekly target step goal for themselves.
**Results and discussion.** Participants in the monetary incentive condition specified a lower effort threshold for themselves (i.e., a goal consisting of fewer steps) compared to those in the hedonic reward condition ($M_{\text{monetary}} = 23,496$ steps vs. $M_{\text{hedonic}} = 34,534$ steps; $B = -11038.32$, $SE = 4547.38$, $t(160) = -2.43$, $p = .016$).

The full distribution of responses (shown in web appendix E) reveals that the majority of participants specified nonzero step goals. However, although sparse, the data toward the lower extreme of the distribution suggest that the prospect of cash incentives increased the likelihood of providing economically rational—but unrealistic—responses. Four participants in the monetary incentive condition indicated a step goal below 100 steps, while no participants in the hedonic condition set a goal within this range (Fisher’s exact: unadjusted odds ratio = 1.05, 95% CI [1.00, 1.11]), $p = .056$). Similarly, 16% of those in the monetary condition specified below 1,000 steps per week, compared to 5% in the hedonic condition ($\chi^2(1) = 4.70, p = .017$).

To summarize, the effect of incentive currency on self-determined thresholds indicates that compared to hedonic rewards, cash incentives led consumers to set easier goals for themselves (in the form of relaxed effort requirements) in order to guarantee receipt of the effort-contingent incentive. This finding suggests that cash may disincentivize incremental effort expenditure and demotivate consumers from aspiring to attain stretch goals.

**Study 1f: Specifying “Safer” Goals (Closed-ended)**

**Procedure.** Study 1f replicates and further builds on the prior two studies’ results, which indicate a shift toward “safer” incentive regimens under contingent cash (compared to hedonic) incentives. Would we obtain the same pattern when people are asked to indicate their preferred threshold of effort expenditure in a closed-ended (rather than open-ended) format? To impose some bounds on the range of responses, the present study ($N = 157$) followed an identical
procedure as study 1e except that the dependent variable was participants’ choice from a preselected list of 11 minimum step thresholds with varying levels of difficulty and, hence, differing (implicit) probabilities of attaining the reward (i.e., ranging from “5,000+ steps each week” to “100,000+ steps each week”; see web appendix F for further details on the procedure).

Results and discussion. Participants randomly assigned to the monetary incentive condition tended to select for themselves options that corresponded to lower effort thresholds (i.e., consisting of a lower minimum step goal) compared to participants assigned to the hedonic reward condition ($M_{\text{monetary}} = 17,911$ steps vs. $M_{\text{hedonic}} = 27,647$ steps; Mann-Whitney $U = 2246$, $Z = -1.75$, $p = .08$). An examination of the distribution of responses (shown in web appendix G) reveals that as the minimum step goal increases, the direction of the differences between the monetary and hedonic incentive conditions reverses: Whereas participants who could attain a cash incentive were more likely to select effort thresholds up to 40,000 steps per week than those who could earn a hedonic reward, the reverse pattern emerges for thresholds of 50,000 steps per week or higher. In particular, 91% of participants in the monetary incentive condition selected minimum goals below 50,000 steps per week compared to only 68% of participants in the hedonic reward condition ($\chi^2(1) = 12.75, p < .001$). Overall, these results further demonstrate that compared to nonmonetary hedonic rewards, cash incentives lead consumers to set lower (i.e., easier and less ambitious) effort thresholds as a means of ensuring receipt of the contingent “compensation.”

Study 1g: Choosing Easy Over Challenging Tasks (Actual Effort Expenditure and Real Choices)

The preceding three studies in this series (studies 1d-1f) examined stated preferences between easier tasks offering smaller rewards and harder tasks offering larger rewards in hypothetical scenarios where effort is involved (but not actually expended). Would these results hold in an incentive-compatible context with consequential choices and that demands real effort expenditure? To this end, study 1g investigated whether participants faced with cash (vs.
hedonic) performance incentives are more likely to choose “safer” (i.e., low-risk but low-reward) alternatives when they must invest effort to earn real incentives (see web appendix H for the full stimuli). We additionally elicited participants’ retrospective evaluations of the extent to which they were more focused on challenging themselves to complete the task (a “process”-oriented attitude) versus on attaining the incentive (an “outcome”-oriented attitude). In accordance with the evocation of a compensation mindset, we posited that consumers incentivized with cash (vs. hedonic rewards) would focus more on the outcome of attaining the incentive than on the process of expending effort and completing the task itself.

Procedure. We randomly assigned 223 participants to one of three conditions: a no-incentive control condition, a monetary incentive condition, and a hedonic incentive condition. Rather than asking people to imagine a hypothetical scenario about joining an exercise or language incentive program, we presented participants with the choice of working on one of two ostensibly “randomly selected” tasks related to cognitive perceptions.

All participants proceeded to a “Word Search Puzzles” page detailing the task. The instructions indicated that they would be asked to solve a word search puzzle of their choice with a pre-generated topic category (e.g., “Sports”) by finding as many “target words” as they could within a given amount of time. We defined “target words” to mean valid English words hidden in the word search puzzle that belong to (i.e., are examples of) the given category; target words could appear horizontally, vertically, or diagonally, be oriented forwards or backwards, and could occasionally share letters across different words. Participants read that “[t]he word search will display the total number of target words in that puzzle but NOT the words themselves” and that the difficulty level would range from easy to difficult depending on the puzzle (with larger grid sizes corresponding to more difficult puzzles). Finally, we displayed a screenshot of a
sample word search puzzle with a “moderate difficulty rating” (composed of a 10×10 grid of letters) to give participants a preview of the task.

After reading the instructions, participants saw information about two different word search puzzles on which they could choose to work. The first (“Word Search Puzzle M”) featured a difficulty rating of “Easy”, with an 8×8 grid size, 10 target words, and a time limit of nine minutes, while the second (“Word Search Puzzle R”) carried a difficulty rating of “Hard”, with a 14×14 grid size, 10 target words, and the same time limit. Participants randomly assigned to the control group saw no other information before indicating their choice between the two puzzles and proceeding to the selected task. Prior to making their choice, participants randomly assigned to either of the two incentive conditions learned about a performance-contingent reward offered for each of the puzzles. In the monetary incentive condition, Puzzle M offered participants $5 in cash if they correctly identified at least 80% of the total target words, whereas Puzzle R offered $10 for reaching the same performance threshold. Those assigned to the hedonic incentive condition read the same information with the exception that the reward consisted of the participant’s choice of one item with retail value of $5 or $10 (corresponding to the easy or difficult puzzle, respectively) from the hedonic gift catalog used in the prior studies. Choice shares of the difficult word search puzzle (over the easy one) served as the primary dependent measure.

We equated the two word search puzzles on all parameters except for the grid size, which governed the difficulty level. Both puzzles used “Animals” as their category, contained the same 10 target words, and allotted nine minutes before the page advanced. Upon completing their chosen word search, participants rated how difficult they perceived the task to be, as well as the extent to which they were “more focused on challenging yourself to complete the task” (1) or “more focused on receiving the reward” (7). (For those assigned to the control condition, who
did not read about any incentive, the “reward” was the noncontingent participation fee for completing the survey.) Those in the two incentive treatments who correctly identified at least 80% of the words received the incentive corresponding to their condition and puzzle choice.

Results and discussion. Choice shares of the more difficult word search puzzle differed by incentive condition ($\chi^2(2) = 7.64, p = .02$), with 35%, 32%, and 53% of participants in the control, monetary incentive, and hedonic incentive conditions, respectively, choosing to work on the hard puzzle over the easy one. Those who could attain cash incentives were equally as likely as those in the control condition to select the difficult puzzle ($p = .77$) and less likely to select the difficult puzzle than those in the hedonic incentive condition ($p = .01$), who were more likely to do so than those in the control condition ($p = .02$).

Responses to the “outcome versus process focus” scale varied by incentive condition ($F(2,220) = 17.60, p < .001$). In particular, participants in the monetary incentive condition attended more to the outcome of receiving the incentive itself ($M = 4.51, SD = 2.13$) compared to their counterparts assigned to the control condition ($M = 2.55, SD = 1.87; t(220) = 5.81, p < .001$) or to the hedonic incentive condition ($M = 3.18, SD = 2.18; t(220) = 3.94, p < .001$). Those in the hedonic incentive condition scored directionally higher on the “outcome versus process focus” measure than those in the control condition ($t(220) = 1.86, p = .06$); however, in both cases, participants’ responses fell below the scale midpoint (control: $t(74) = -6.73, p < .001$; hedonic: $t(73) = -3.25, p = .002$), indicating an overall focus on process over outcome. In contrast, responses among those assigned to the monetary incentive condition fell above the scale midpoint ($t(73) = 2.07, p = .04$), indicating an overall focus on outcome over process. These patterns suggest that tasks which feature incentives denominated in monetary currency (vs.
hedonic currency or no incentives) shift individuals’ emphasis toward the outcome of attaining the incentive and away from the process of exerting effort and engaging in a given task.

How do these perceptions break down based on participants’ chosen task? A 3 (incentive condition: control vs. monetary vs. hedonic) × 2 (choice: easy puzzle vs. difficult puzzle) factorial ANOVA indicated a main effect of incentive condition ($F(2,217) = 23.40$, $p < .001$), qualified by an incentive × choice interaction effect ($F(2,217) = 6.35$, $p = .002$; see figure 1).

Specifically, among participants assigned to the control condition, reported “outcome” (as opposed to “process”) focus was higher for participants who chose the easy puzzle ($M_{easy} = 3.06$ [SD = 1.95], $M_{hard} = 1.58$ [1.24]; $F(1,217) = 9.25$, $p = .003$). In the monetary incentive condition, this pattern reversed, such that participants who chose the difficult puzzle reported a higher outcome focus than those who chose the easy puzzle ($M_{easy} = 4.20$ [2.09], $M_{hard} = 5.17$ [2.12]; $F(1,217) = 3.75$, $p = .05$). In contrast, those in the hedonic condition scored equally low on this measure regardless of whether they chose the easy or difficult puzzle ($M_{easy} = 3.51$ [2.15], $M_{hard} = 2.87$ [2.19]; $F(1,217) = 1.88$, $p = .17$). These patterns offer some insight into what participants valued conditional on what they chose. Absent any bonus, people who chose the difficult (vs. easy) puzzle reported directing their attention more to engaging themselves in a challenging task, consistent with a baseline intrinsic motivation effect. This pattern was attenuated for participants who could earn hedonic prizes: Those who selected the difficult task became more focused (relative to participants in the control condition) on reward attainment. However, consistent with a compensation mindset, cash-incentivized participants who selected the difficult puzzle did so primarily to receive the (larger) reward rather than to challenge themselves.
In sum, the above findings indicate that, as predicted by the notion of a compensation mindset and consistent with the results from studies 1a to 1f, a cash “currency” increased people’s tendency to select easier goals and effort tasks to improve the odds of receiving an effort-contingent incentive. These data also furnish insight into the psychological mechanism by which cash incentives demotivate people from stretching for higher goals and effort thresholds—namely, by generating a compensation mindset characterized by a greater focus on the outcome of receiving the incentive rather than on the process of engaging in the task or activity.

Whether choosing between reward alternatives or setting their own performance goals and effort streams, participants displayed a greater attraction to guaranteed but smaller incentives when these incentives consisted of cash as opposed to hedonic rewards of equivalent retail value. Taken together, seven studies demonstrate that cash (dis)incentives not only enhance choices of smaller guaranteed rewards at the expense of larger uncertain rewards (studies 1a-1c), but also shift choices toward tasks and programs that are easier and less challenging to complete—thereby making reward-attainment more likely (studies 1d-1g). Such behavior typifies a key instantiation of the compensation mindset—the emphasis on “settling for” rewards that are assured and easily obtained, even at the cost of a lower payoff and a lower expected value.

**STUDY SERIES 2: CASH INCENTIVES ENHANCE PREFERENCE FOR IMMEDIATE REWARDS**

Using the context of risky choice, study series 1 provides evidence of a preference shift toward smaller-certain incentives over larger, less certain incentives when such incentives are denominated in a cash rather than a hedonic currency. The preference for guaranteed or easy-to-achieve rewards compared to probabilistic or hard-to-achieve rewards reflects an overall attraction to alternatives that afford a “safer” payoff route. Another outcome of a compensation mindset
relates to tradeoffs involving time: Individuals preoccupied with compensation are also predicted to strongly weight incentives that they can receive now rather than later. In other words, consumers influenced by such a mindset may think to themselves: “If I must expend effort to obtain my incentive, I want to get it *for sure* and get it *now*.” We predicted that cash (relative to hedonic) incentives would analogously enhance preference for immediate over delayed rewards.

*Study 2a: Exercise Incentive Programs*

*Procedure.* Two-hundred and eighty-two (282) respondents, randomly assigned to a monetary incentive or a hedonic incentive condition, considered two exercise programs (A and B; order counterbalanced) similar to the scenario used in study 1a. Both programs lasted one week (described as a trial run), and both offered members a reward for walking at least 60,000 steps at the end of the trial run. In the monetary incentive condition, participants read about Program A, which offered a smaller reward ($20 in cash) that they would receive immediately, followed by Program B, which offered a larger reward ($30 in cash) that they would receive in two months after the trial run. In the hedonic condition, the smaller but immediate reward consisted of the participant’s choice of one hedonic item (with retail value of $20) from the catalog used previously, while the larger but delayed reward consisted of the participant’s choice of one hedonic item (with retail value of $30) from the same catalog. Participants then chose the exercise incentive program they preferred to join.

*Results and discussion.* Presentation order did not affect choice shares ($\chi^2(1) = .21, p = .65$) or interact with incentive condition to affect choice shares ($\chi^2(1) = 2.26, p = .13$). Whereas 67% of participants in the monetary incentive condition chose the program with the immediate but smaller reward over the program with the delayed but larger reward, only 45% of participants in the hedonic incentive condition chose the program with the immediate but smaller reward. Analogous to the results pertaining to risky choice (study series 1), the tendency to prefer the
smaller-immediate (vs. larger-delayed) incentive was more pronounced among participants in the monetary compared to hedonic incentive condition ($\chi^2(1) = 12.75, p < .001$), indicating that cash incentives increased preference for immediate rewards (despite lower earnings).

Study 2b ($N = 353$) replicated this result using the foreign language scenario (see web appendix I): 53% of participants in the monetary incentive condition chose the program with the smaller-immediate (vs. larger-delayed) reward compared to only 38% of participants in the hedonic incentive condition ($\chi^2(1) = 7.94, p = .005$).

In concert, study series 1 and 2 provide convergent evidence for a compensation mindset underlying the provision of contingent monetary incentives. Specifically, participants offered cash incentives (vs. hedonic rewards) were more likely to favor incentive systems with smaller but guaranteed, easy to obtain, and immediate rewards over ones with larger but uncertain, hard to obtain, and delayed rewards.

**STUDY SERIES 3: THE ROLE OF EFFORT AND INCENTIVE CONTINGENCY**

The choices we have investigated up until now have consisted of scenarios involving the provision of incentives contingent on some form of effort expenditure—whether in the form of steps walked, exams passed, or word search puzzles solved. A natural question is whether similar results would emerge if we were to sever the dependency between incentive and effort.

Recall that we posited that the compensation mindset elicited by monetary incentives implies a desire to secure more “bang for the buck.” Such a proposition encompasses an output-oriented component on the one hand, involving calculative considerations aimed at maximizing the magnitude of the reward (“What am I getting out?”), and an input-oriented element on the other hand, involving considerations aimed at minimizing costs and effort (“What am I putting in?”). The evocation of a compensation mindset, we argue, entails a mental comparison between
output and input in evaluations of whether a focal reward justifies a given level of performance or effort (see also Rottenstreich and Kivetz 2006). Judgments of the value of a cash incentive, then, are likely to be made in a transactive sense relative to the effort requirements in place. In the presence of such requirements, people should be attracted to incentive structures that offer rewards they can attain quickly and for sure (as “due payment” or “entitlement” for their efforts). However, if we eliminate the effort investment needed to obtain a reward, then cash-incentivized individuals—who are more likely to be focused on compensation—may be more likely to shift considerations toward maximizing reward magnitude and expected (or net present) value and, in doing so, show less aversion to alternatives offering uncertain or delayed but larger rewards.

Using the case of loyalty programs, Kivetz (2003) found that in the context of risky choice (i.e., when trading off the magnitude and probability of a reward), consumers were more likely to prefer sure, small rewards over uncertain, large rewards when earning the rewards was contingent on expending a given amount of effort compared to when the rewards were given as free gifts. In other words, when there exists an effort-reward contingency, people appear to prioritize obtaining the incentive for sure (as opposed to risking the possibility of “leaving empty-handed”). Consistent with the notion that cash incentives give rise to a compensation mindset, we predicted that this type of expectation based on effort may be stronger when an incentive is denominated in monetary terms.

Study 3a: The Effect of Effort Requirement (Incentive Contingency) on Preference for Certainty

Procedure. Participants consisted of 211 respondents randomly assigned to one of four conditions in a 2 (incentive type: monetary vs. hedonic incentive) × 2 (effort requirement: effort required vs. no effort required) between-subjects design. Following the risky choice exercise scenario from study 1c, participants decided between a program offering a certain but smaller reward ($5, in either cash or hedonic currency, corresponding to the incentive type condition)
and one offering an uncertain reward with greater expected value (1 in 20 chance to receive $120, in either cash or hedonic currency). Both programs encouraged members to walk at least 60,000 steps per week. Participants in each incentive type condition were further randomly assigned to one of two “presence or absence of effort” conditions. In the “effort required” condition, participants read that they would earn the focal reward only if they meet the weekly 60,000-step goal (identical to the instructions from study 1a). Those in the “no effort required” condition read that they would earn the focal reward regardless of how many steps they walk.

Results and discussion. A binary logistic regression on the choice share of the smaller-certain incentive revealed a (directional) main effect of the “presence or absence of effort” factor ($B = .56, SE = .41, \chi^2(1) = 2.61, p = .11$), qualified by a significant presence of effort × incentive type interaction effect ($B = -2.12, SE = .62, \chi^2(1) = 11.71, p = .001$; see figure 2a). Specifically, when effort was required (i.e., attaining the reward was contingent on meeting the step goal), participants were more likely to select the smaller-certain reward when offered monetary incentives as opposed to hedonic rewards (87% monetary vs. 60% hedonic; $\chi^2(1) = 11.47, p = .001$)—replicating the patterns observed in studies 1a and 1b. However, when effort was not required (i.e., when the incentive was given regardless of steps walked), this effect was eliminated, with participants being directionally less likely to select the smaller-certain reward when they were in the monetary as opposed to the hedonic incentive condition (58% vs. 73%; $\chi^2(1) = 2.39, p = .12$).

In other words, only when the incentive was contingent on reaching a performance threshold (necessitating a substantial degree of effort expenditure) did participants facing cash incentives exhibit a stronger tendency to trade off reward magnitude in return for certainty. Absent such a contingency, people who could earn a cash (vs. hedonic) incentive were more likely to focus on expected value calculations that favored the uncertain but larger reward.

Study 3b: The Effect of Effort Requirement (Incentive Contingency) on Preference for Immediacy
Study 3b investigated the analogous hypothesis that the relative greater preference for smaller-sooner (vs. larger-later) rewards induced by cash incentives will be diminished when the same cash incentives are no longer contingent on performance. That is, when we offer a cash payment regardless of consumers’ effort expenditure, they should be more likely to opt for alternatives that offer greater earning potential or net present value.

Procedure. Participants consisted of 356 respondents randomly assigned to one of four conditions in a 2 (incentive type: monetary vs. hedonic incentive) × 2 (presence or absence of effort: effort required vs. no effort required to attain the incentive) between-subjects design. As in study 2a, participants again chose between two exercise incentive programs, both of which encouraged members to walk at least 60,000 steps: one offered a smaller but immediate reward of $20 immediately (denominated in either cash or hedonic currency, corresponding to the incentive type condition), while the other offered a larger but delayed reward of $30 in two months (in either cash or hedonic currency). In the “effort required” condition, participants could earn the reward only if they met or exceeded the 60,000-step goal. In contrast, those in the “no effort required” condition could earn the reward regardless of how many steps they walked.

Results and discussion. A binary logistic regression on the choice share of the smaller-immediate incentive revealed a main effect of incentive type ($B = .78$, $SE = .30$, $\chi^2(1) = 3.42$, $p = .06$), qualified by an interaction between presence of effort and incentive type ($B = -.77$, $SE = .43$, $\chi^2(1) = 3.18$, $p = .075$; see figure 2b). When the incentive was contingent on effort, participants were more likely to select the smaller-immediate reward when they encountered monetary incentives as opposed to hedonic rewards ($59\%_{monetary}$ vs. $40\%_{hedonic}$; $\chi^2(1) = 6.91$, $p = .009$)—replicating the pattern of results observed in studies 2a and 2b. However, when we removed any incentive contingency, this effect vanished ($48\%$ vs. $47\%$; $\chi^2(1) = .002$, $p = .96$).
Like the results obtained in study 3a, the findings from study 3b highlight the importance of effort or incentive contingency. That is, only when the incentive was contingent on reaching a performance threshold or goal (necessitating some degree of effort expenditure) did participants who faced cash incentives exhibit a stronger tendency (compared to participants motivated with hedonic rewards) to trade off reward magnitude in return for immediacy. Absent such effort requirements and contingency, people who could earn a cash incentive appeared to be more likely to focus on net present value calculations that favored the delayed but larger reward.

One potential alternative explanation for the results found in study series 1 and 2 is asymmetrical scope sensitivity, such that participants might have construed the difference in attractiveness between the larger and smaller hedonic rewards as greater than the difference in attractiveness between the larger and smaller cash incentives. However, both prior research and the data from study series 3 cast doubt on this account. Evidence on the affective psychology of value (Hsee and Rottenstreich, 2004; Rottenstreich and Hsee 2000) suggests that, if anything, consumers tend to be more scope sensitive to changes in monetary units than nonmonetary (i.e., typically more affect-laden) ones. Further, if participants in the hedonic incentive condition were indeed more willing to select larger-uncertain rewards because of greater scope sensitivity in valuation of hedonic (vs. cash) rewards, then we would expect to observe a similar pattern of results in the “effort required” and “no effort required” conditions, which we did not.

**STUDY SERIES 4: A “PREMIUM” ON CERTAINTY AND IMMEDIACY**

The results of study series 3 indicate that the requirement to expend effort moderates when cash (compared to hedonic) incentives enhance preference for smaller-certain over larger-
uncertain rewards. The next set of studies examine whether consumers evaluate tradeoffs between probability and magnitude of rewards in the same manner even when none of the offered incentives can provide complete certainty or immediacy. A compensation mindset, we propose, leads people to try and guarantee the receipt of an incentive (or “compensation”) in return for their effort; to do so, consumers place the certainty and immediacy of the reward above other considerations, such as the reward’s magnitude. However, offering a cash incentive with merely a greater probability (but no certainty) or temporal proximity (but no immediacy), compared to a lower probability or more temporally distant cash incentive, may not be sufficiently enticing to override considerations of expected value. That is, when neither alternative allows the possibility of receiving a reward for sure or immediately, we expect a greater attraction toward cash rewards that maximize expected, or net present, value.

*Study 4a: Preference for Absolute Certainty*

*Procedure.* Participants consisted of 346 respondents randomly assigned to one of four conditions in a 2 (incentive type: monetary incentive vs. hedonic reward) × 2 (choice set: certainty present vs. certainty absent) between-subjects design. Using the risky choice paradigm from study 1c, participants chose between two exercise programs that offered members a weekly reward (denominated in either cash or hedonic currency, corresponding to the incentive type condition) conditional on meeting a target goal of 60,000 steps per week. Half of the participants in each incentive type condition were further assigned to one of two choice sets. In the “certainty present” condition, participants faced the same choices as those in the “effort required” condition in study 3a—that is, between one program with a smaller but completely certain reward ($5, in either cash or hedonic currency) and a second program with a larger but uncertain reward (a 1 in 20 chance of $120, in either cash or hedonic currency). Those assigned
to the “certainty absent” condition confronted the same choice except that the program with the smaller reward also featured uncertainty, albeit to a lesser degree (1 in 10 chance to earn $55).

Results and discussion. A binary logistic regression on the choice share of the smaller, less uncertain incentive revealed an incentive type × choice set interaction (\( B = -.93, SE = .48, \chi^2(1) = 3.87, p = .049 \)), with no main effects of either factor (see figure in web appendix J).

Among those in the certainty present condition, directionally more people exposed to the cash incentive (vs. hedonic reward) chose the program with the smaller-certain reward (75% vs. 68%; \( \chi^2(1) = .86, p = .36 \)). Yet, when both rewards were probabilistic, fewer participants in the cash incentive condition chose the smaller, less uncertain option compared to those in the hedonic reward condition (62% vs. 75%; \( \chi^2(1) = 3.64, p = .056 \)). While choice shares of the smaller, less uncertain reward did not differ by choice set among those who faced a hedonic reward (\( \chi^2(1) = .94, p = .33 \)), those who faced a cash incentive were more likely to select the smaller-certain reward program when certainty was present as opposed to absent (\( \chi^2(1) = 3.46, p = .06 \)).

Overall, these results indicate that cash incentives are likely to induce a preference for effort-contingent rewards that are assured (with 100% certainty) as opposed to rewards that merely have a relatively higher, but not certain, probability of being realized even after the required effort has been expended. Such behavior is consistent with a compensation mindset which privileges a desire for rewards that are certain, but which prompts consumers to attempt to maximize expected returns when reward certainty becomes impossible.

Study 4b: Preference for Absolute Immediacy

We next tested, in study 4b, whether the analogous pattern would emerge for tradeoffs involving time; we predicted that when an immediate, contingent cash incentive is no longer available as an option, people would be more likely to select the larger but more delayed reward in the interest of maximizing net present value.
**Procedure.** Participants consisted of 348 respondents randomly assigned to one of four conditions in a 2 (incentive type: monetary incentive vs. hedonic reward) × 2 (choice set: immediacy present vs. immediacy absent) between-subjects design. Following the scenario presented in study 2a, we again asked participants to choose between two exercise incentive programs in their area, both of which offered a reward—denominated in either cash or hedonic currency, corresponding to the incentive type condition—for walking at least 60,000 steps. Half of the participants in each incentive type condition were further assigned to one of two choice sets. In the “immediacy present” condition, participants chose between a program with a smaller reward of $20 (in either cash or hedonic currency) to be received *immediately*, and another program with a larger reward of $30 (in either cash or hedonic currency) to be received in two months. Paralleling the design of study 4a, those assigned to the “immediacy absent” condition read the same information except that the program offering the smaller reward also featured delay, albeit to a lesser degree ($24 to be received in one month). Note that in both choice sets, the larger, more delayed reward offers a higher net present value than the smaller, less delayed reward assuming an empirically reasonable range of discount rates (e.g., indifference between $20 now and $30 in two months, and between $24 in one month and $30 in two months, implies annual exponential discount rates of 243% and 267%, respectively).

**Results and discussion.** An analogous pattern to the risky choice results emerged when participants traded off between reward magnitude and delay. A binary logistic regression on choice share of the smaller but less delayed incentive revealed an incentive type × choice set interaction ($B = .93, SE = .45, \chi^2(1) = 4.24, p = .039$), with no main effects of either factor (see figure in web appendix K). Among those in the immediacy present condition, directionally more people exposed to the cash incentive (vs. hedonic reward) chose the program with the smaller-immediate reward ($69\%_{\text{monetary}} \text{ vs. } 51\%_{\text{hedonic}}; \chi^2(1) = 6.13, p = .13$). When both incentives
lacked complete immediacy, however, equally many participants in the cash and hedonic incentive conditions chose the less delayed, smaller incentive (54% vs. 57%; \( \chi^2(1) = .18, p = .67 \)). While choice shares of the smaller, less delayed reward did not differ by choice set among those who faced the hedonic reward (\( \chi^2(1) = .63, p = .43 \)), those who faced the cash incentive were more likely to select the smaller-immediate reward when immediacy was present as opposed to absent (\( \chi^2(1) = 4.60, p = .03 \)). Hence, when reward immediacy becomes impossible (i.e., both options are delayed), a compensation mindset may induce consumers to be less willing to sacrifice a reward’s magnitude for its delay and prompt an attempt to maximize net present value.

Taken together, the data from studies 4a and 4b suggest that the effect of cash incentives on increasing consumer choices of immediate or sure—yet smaller—rewards is less pronounced when the incentives (i) are not contingent on effort and (ii) are not attainable without accepting risk or delay. In this sense, monetary incentives may cause people to assign a “premium” to options that promise absolute certainty and immediacy of a reward (at the cost of its expected, or net present, value). Such preferences provide additional evidence of a compensation mindset in response to cash incentives, whereby consumers privilege complete immediacy and certainty with respect to obtaining a contingent cash award.

**CASH INCENTIVES INCITE GREATER CHEATING ON REAL-EFFORT TASKS**

The empirical evidence we have presented so far implicate a compensation mindset that affects tradeoffs and choices involving risk and time. Specifically, incentivizing consumers with cash, compared to hedonic rewards with equivalent monetary value (and to unrewarded controls) enhances consumers’ preferences for guaranteed (i.e., certain or easy to obtain) and immediate incentives. A preference for greater certainty and immediacy of incentives was, moreover,
associated with lower effort and performance thresholds, a relationship reflected in the marketplace: Typically, higher performance thresholds or goals require greater effort investment and entail more risky or delayed incentives.

A separate but related question is whether the posited compensation mindset and its effects on consumers’ willingness to expend effort and tolerate risk and delay in reward attainment also influence the integrity of consumers’ performance and effort investment. To the extent that cash incentives generate a compensation mindset that leads people to care less about the means by which a desired outcome is achieved (see study 1g), people may be more likely to focus on “easy” ways or shortcuts to guarantee and expedite cash incentives—they may cheat more. Recall that in study 1d, participants who faced the prospect of earning a cash (vs. hedonic) bonus for walking some number of steps per week were more likely to almost “game” the system by indicating excessively low weekly step counts that would guarantee them compensation (e.g., below 1,000 or even 100 steps—unreasonable estimates barring extreme cases of sedentarism). Although such responses are not tantamount to cheating per se, they may nevertheless hint at the possibility that monetary incentives can blunt people’s willingness to put forth an honest attempt that follows the spirit of the prescribed incentive scheme.

The corruptible effects of money on individuals’ ethical behavior has some support in the money priming literature. For example, participants exposed to abundant wealth or the concept of money (e.g., after seeing 7,000 dollar bills instead of 24 dollar bills) cheated more frequently (Gino and Pierce 2009; see also Gino and Mogilner 2014). In our studies, however, we focus on cheating behavior as a function of effort-contingent incentives rather than activating reminders of money in the symbolic sense. As study series 3 suggests, the effects of a compensation mindset—a pronounced preference for guaranteed and immediate rewards—is likely to only manifest in the presence (rather than absence) of incentive contingency. Whereas prior work has
largely contrasted money primes with either neutral primes, the absence of money (e.g., scarcity), or other resources (e.g., time), we assessed the differential effects of contingent cash incentives with noncash hedonic rewards (of equivalent monetary value), and with unrewarded controls, on cheating behavior. Using real-effort tasks with real incentives, the next series of studies test the hypothesis that participants incentivized with cash would exhibit a greater degree of cheating than those who faced no incentives (i.e., in a control condition) or those who faced hedonic rewards of equivalent monetary value.

**Study 5: Counting Zeros**

*Procedure.* Study 5 assessed whether cash incentives, relative to noncash hedonic rewards, incite more cheating in an effort-contingent activity. Participants consisted of 279 respondents randomly assigned to one of three incentive conditions (control vs. cash incentive vs. hedonic reward) who completed a survey ostensibly about “cognitive perceptions and processes.” In the control condition, participants received only a baseline fee of $0.90 for completion. Those in the incentive treatments received the same fee but could also earn a bonus reward if they scored in the top 5% of all participants. The performance-contingent incentive consisted of either $10 cash (in the cash incentive condition) or the participant’s choice of one hedonic item of equivalent retail value from a gift catalog (in the hedonic reward condition). Because we explicitly stated the monetary value of the hedonic reward, any difference that arises between the two performance-based incentive conditions cannot be due to pure money priming.

All participants worked on a “counting zeros” task (adapted from Abeler et al. 2011) that involved counting the number of zeros appearing in a series of five tables (consisting of 15 rows $\times$ 29 columns) made up of randomly ordered 0s and 1s (see web appendix L). We allotted participants only 90 seconds to count each table. Importantly, we cautioned them to “try to count the zeros using just your eyes instead of with the help of external tools like the *find in page*
search command.” This last instruction drew participants’ attention to the possibility of cheating on the task, since the exact number of zeros in a given table could be easily obtained by either navigating to their browser menu and selecting “find in page” or by entering the “CTRL+F” command on their keyboard (which opens the same search function). Because the time limit we imposed rendered correct responses (i.e., exact answers) highly unlikely without the aid of these shortcuts (an assumption we validated empirically), we interpret higher performance scores on the task as evidence of greater cheating.

**Results and discussion.** For each participant, we calculated a score given by the total number of tables for which they “correctly” counted the number of zeros. We normalized this measure using a log transformation (the untransformed data yield similar results). The average number of tables counted “correctly” varied by incentive condition ($F(2,276) = 4.34, p = .01$). Specifically, those in the cash incentive condition “cheated” more on this metric ($M = 1.01, SD = 1.58$) relative to those in the control condition ($M = .53, SD = 1.21; t(276) = 2.44, p = .015$) and relative to those in the hedonic reward condition ($M = .47, SD = 1.09; t(276) = 2.62, p = .009$); there was no difference between the control and hedonic reward groups in the average number of tables “correctly” counted ($t(276) = -.09, p = .93$). Further, a greater proportion of participants provided the exact solution in the cash incentive condition relative to the control or hedonic incentive conditions for each table (see figure 3).

A potential alternative explanation for study 5’s results is that participants who could earn cash incentives (compared to hedonic rewards) were simply more motivated to do well on the task and genuinely performed better on the task. To address this concern, we conducted a posttest on a separate sample of participants ($N = 280$) using a procedure identical in every aspect to study 5 except that cheating was impossible because each table was presented as an
image pasted on the screen. If cash incentives led people to cheat more and hence count more tables “correctly,” then when participants can no longer use any shortcuts to automatically detect the number of zeros in a table, performance should no longer be higher in the cash incentive condition compared to the unrewarded control or hedonic reward conditions. We tested this prediction and found no effect of incentive type on performance (see web appendix M), suggesting that participants in study 5 were indeed more likely to cheat on the counting zeros task under the provision of cash incentives (vs. no incentives or hedonic rewards).

*Study 6: Solving Anagrams*

Study 5 provides initial evidence that cash incentives increase cheating behavior compared to non-monetary, hedonic rewards involving equivalent retail value and compared to a no-incentive (control) condition. Study 6 sought to replicate and generalize this finding using a different paradigm. In particular, we adapted an anagram task from Wiltermuth (2011), which allows participants the opportunity to cheat by falsely over-reporting their performance to increase their chances of receiving a contingent incentive. We again predicted that presenting individuals with cash incentives (compared to no incentives or hedonic rewards) would increase cheating due to a greater preoccupation with securing monetary gain.

*Procedure.* One hundred and seventy-six (176) participants, randomly assigned to one of three incentive conditions (no-incentive control vs. cash incentive vs. hedonic reward), completed an online survey about “cognitive perceptions and processes.” Participants read that they would complete a task related to cognitive perceptions; those in the cash incentive and the hedonic reward treatment conditions further learned that they would have the chance to receive an additional incentive depending on their performance (see web appendix N for stimuli).

Next, all participants were directed to a page with instructions for an “Unscrambling Words” puzzle that tasked them with unscrambling a series of jumbled words (i.e., anagrams) on a
page in a given amount of time. (We defined “unscrambling” to mean rearranging the letters such that the resulting word forms a valid English word containing all the letters of the original scrambled word.) The instructions specified the same scoring mechanism whereby they would earn 10 points for each anagram they report successfully solving in order from the beginning. Adopting the language used in Wiltermuth (2011), we emphasized the order aspect: “This means you should try to solve the jumbles in the order they appear. So, for example, if you successfully unscramble the first 3 word jumbles but not the 4th, you will earn points only for the first 3—even if you also successfully unscramble the 5th, 6th, and 7th word jumbles.” We also added a cautionary note to “use only your mind, and no other tools, to solve the jumbles.” Participants assigned to the two incentive conditions additionally read information about the incentive, which they would earn if their total score fell within the top 5% of participants. In the cash incentive condition, this reward consisted of $30 in cash; in the hedonic reward condition, it consisted of the participant’s choice of one hedonic item (worth $30) from the gift catalog used in previous studies.

We presented nine anagrams on a single page. For each anagram, participants indicated whether they successfully unscrambled that anagram by checking either a “Not Solved” or “Solved” button. To remove any perception of external monitoring by the researcher, we did not ask them to write their solutions at any point. A timer appeared at the bottom of the page that counted down from 420 seconds (seven minutes), after which the page automatically advanced. Of the nine anagrams, eight could be unscrambled without excessive mental effort to form fairly common words such as “house” and “jumping.” However, the third anagram (“UNAAGT”) could only be solved to spell taguan, an obscure word for a species of flying squirrel. Previous pretesting conducted by Wiltermuth (2011) confirmed that correctly identifying this solution is exceedingly unlikely, with not a single participant able to successfully unscramble the “UNAAGT” jumble in the original study. Further, while it is conceivable that people could turn
to online anagram solvers despite our instructions, we found no programs that returned *taguan* as a solution. Participants could therefore “cheat” by falsely reporting that they had solved this third anagram; doing so would allow them to considerably increase their total score (and hence chances of winning the incentive for those assigned to either of the two incentive conditions) by earning credit for the subsequent six anagrams. Thus, we examined the frequency with which participants reported successfully solving the third practically-impossible (“UNAAGT”) anagram as the primary dependent measure.

*Results and discussion.* The incidence of cheating was relatively high in the aggregate, with 63% of participants reporting having solved the third “impossible” anagram. However, a binary logistic regression revealed that the frequency of cheating varied across incentive condition ($\chi^2(2) = 13.64, p = .001$), with 79%, 62%, and 45% of participants in the monetary incentive, hedonic reward, and control conditions, respectively, indicating successfully solving the third anagram. Those in the monetary incentive condition cheated more on this metric than those in the hedonic reward condition ($p = .029$) and more than those in the control ($p < .001$); participants in the hedonic reward group cheated directionally more than those in the control group ($p = .08$). Although the incentive to act dishonestly overall was present for all participants given the lack of monitoring, it appears that the incidence of cheating was particularly pronounced among those who could attain cash incentives.

We obtained the same finding in another study (*i.e.*, study 7) using a similar metric (degree of overreporting own performance) on yet another cheating paradigm, one that involved guessing marble counts (see detailed report of method, stimuli, and results of study 7 in web appendix O). Taken together, the convergent pattern of results across three studies contribute additional evidence for the disincentivizing effects—in the form of increased cheating—triggered by performance-contingent cash incentives (relative to noncash hedonic rewards and to
no-incentive control situations). Such behavior falls in line with the “symptoms” of a compensation mindset that places the ends (attaining a cash incentive) above the means (ethical conduct in the process of attaining the prize).

**PEOPLE PREFER CASH INCENTIVES AND THINK THEY ARE MORE MOTIVATING**

Study series 1 through 4 demonstrate that, relative to hedonic rewards of equivalent retail value (and relative to unrewarded controls), cash incentives enhance preferences for alternatives that offer smaller but certain, immediate, and easy to obtain rewards (over larger but probabilistic, delayed, and challenging to obtain rewards). Further, studies 5 through 7 show that cash incentives increase cheating behavior directed at attaining the incentives. These findings together highlight the deleterious effects of cash incentives on motivation and performance.

However, when facing a direct choice between cash incentives and hedonic rewards, which incentive would most people prefer, and which would they think (or predict) is more motivating? Drawing from previous research that suggests the dominance of monetary over nonmonetary incentives in individuals’ stated preferences (e.g., Jeffrey 2009; Kivetz and Simonson 2002b), we anticipated that reward programs offering cash-based performance incentives (vs. hedonic rewards of equivalent retail value) would generate greater lay appeal, both in terms of enrollment preferences and perceived motivational force.

Study 8 (N = 339) presented participants with two exercise incentive programs that offered a reward of equivalent expected value but denominated in different currencies (cash vs. hedonic). Participants indicated: (i) which incentive program they would prefer to join, one that offered cash incentives or another that offered hedonic rewards; and (ii) which incentive program they believe would motivate them to expend more effort and walk more steps (see web appendix P for methodological details). The vast majority of participants (83%) preferred the
cash incentive program over the hedonic reward program ($\chi^2(1) = 146.69, p < .001$), with 83% identifying the former as more motivating ($\chi^2(1) = 149.34, p < .001$).

Yet, these stated preferences do not align with the choices observed in study series 1, where incentivizing people with cash led them to select “safer” alternatives with an easier-to-achieve goal but lower payoff (study 1d), to explicitly set lower performance thresholds (studies 1e-1f), and to opt for easy (lower risk, lower reward) over challenging (higher risk, higher reward) tasks (study 1g). Consumers’ stated preferences for cash are also inconsistent with the choices observed in study series 2, where contingent cash incentives led participants to select immediate but smaller (vs. delayed but larger) rewards. Finally, individuals’ lay beliefs about the motivating power of cash incentives are at odds with their revealed behaviors, as observed in studies 5 through 7, in which participants were more likely to cheat to earn a cash incentive as opposed to a hedonic reward (and compared to unrewarded controls). Cash incentives in this respect evidently give rise to a “say versus do gap,” whereby people’s stated preferences and beliefs favor cash, but their actual behaviors reveal that cash (dis)incentives impede effort investment, goal aspiration, and task integrity.

GENERAL DISCUSSION

The use of cash incentives in an attempt to motivate customers, employees, salespeople, and managers is ubiquitous in today’s marketplace. While money certainly has its benefits and cash may indeed be king in terms of its fungibility, flexibility, and lay appeal, we know less about the psychological influences of cash incentives as opposed to other types of common rewards (e.g., hedonic items and experiences). The current research investigates how cash incentives—and the compensation-centric mode of reasoning they instill—shape people’s preferences and choices (study series 1-4) as well as their behaviors (study series 5-7). The
findings documented herein demonstrate that contingent cash incentives, relative to hedonic rewards of equivalent monetary value, shift preferences toward alternatives that maximize how likely, as well as how soon, one’s earnings are received (while sacrificing reward magnitude and higher goal achievement). However, the tendency to select certain but smaller and immediate but smaller (over uncertain but larger and delayed but larger) cash incentives is attenuated when 

(i) the reward no longer depends on meeting an effort threshold, and (ii) both rewards are probabilistic or delayed. Under both hypothetical scenarios and consequential tasks with real rewards, incentives denominated in cash currency led consumers to specify lower performance goals and effort thresholds, as well as to choose easier over difficult activities. Offering people cash incentives, as opposed to hedonic rewards or no incentive, led people to cheat to a greater degree in order to enhance their chances of attaining greater (cash) compensation for their efforts. Finally, despite the selection of safer and easier alternatives when incentivized with cash (as opposed to with hedonic rewards), when given a direct choice between the two incentive types, people overwhelmingly prefer cash and simultaneously predict it would motivate them to invest more effort (study 8).

Conceptually, this research program attempts to understand the compensation-centric motive induced by monetary incentives, the varied motivational consequences it engenders, and the factors that drive when it is more likely to prevail. Designing and enacting more personally motivating incentive systems presents an opportunity for marketers and policymakers who wish to improve the decisions and behaviors of their constituents.

Future Work

The kinds of questions we have probed in this essay call for several interesting (we believe) avenues of future research. It would be useful to further test the mediating role of a
compensation mindset in shaping people’s attraction to certain, easier, and immediate rewards. While study 1 suggests that consumers who face monetary incentives (vs. no incentives or noncash hedonic rewards) do indeed attend more to the outcome of receiving the contingent reward as opposed to the process of earning it, direct evidence of such a mindset may also be discerned in a number of other, perhaps subtler, ways. One informative source, for example, could consist in people’s intuitive reactions to reward programs offering different incentives.

Using text analysis tools to code participants’ open-ended reasoning, we would expect to find a greater focus on concepts related to certainty, immediacy, and compensation for those facing monetary (but not nonmonetary) rewards. Further, holding the amount of effort constant, cash incentives should induce people to place greater weight on feasibility concerns (“Can I earn the bonus at all?”) rather than desirability ones (“How much can I earn?”).

Another strategy is to test whether, per a compensation-mindset, there indeed exists an expectation of a one-to-one relationship between effort and outcome among those incentivized with cash. Specifically, when money enters the equation, we anticipate that people will tend to find contracts and activities acceptable only when the amount of possible earnings is proportional to the amount of effort they must expend. Relatedly, tasks in which effort is perceived to outweigh the reward magnitude should be evaluated as more aversive, and meet with greater reactance, by these same individuals. An analysis of participants’ perceptions and preferences surrounding tiered loyalty programs (i.e., each with a different distribution of effort-reward ratios) will be illuminating in this regard. Information that pertains to the relative comparison between input (effort) and output (incentive) should command greater attention and consideration when cash incentives, as opposed to noncash rewards, are at stake.
We envision several empirical extensions to develop and test the generalizability of the findings pertaining to performance and cheating behavior. First, continuing to compare cash incentives to noncash rewards in the context of other cheating paradigms would be useful to test the robustness and generalizability of the observed effects. Second, the findings pertaining to cheating behaviors echo a broader notion of “taking the easy way out.” The idea that cash incentives increase the tendency to settle for safer, less ambitious goals calls for further work to identify situations in which people may be tempted to select the path of least resistance or take advantage of “loopholes” (i.e., opportunities to cheat in order to ensure attaining an incentive). For example, individuals who face cash incentives might stop persisting on a task as soon as they encounter an opportunity or license to give up. Once endowed with monetary compensation immediately or midway through the effort stream—and therefore having satisfied the desire to be rewarded—, consumers may be less inclined to work hard or finish the task in good faith.

We have limited our study of noncash incentives to tangible hedonic rewards as a juxtaposition against cash because (i) such rewards are prevalent and commonly employed in industry, and (ii) they afford a fairly conservative control, as they are not only similarly extrinsic as cash incentives but are explicitly equated in retail value. Nevertheless, many other forms of noncash incentives exist, including social incentives (e.g., Bandiera, Barankay, and Rasul 2010) and contingent self-reward (e.g., Bandura 1976). More investigation is needed to disentangle the efficacy of these alternative motives relative to cash and similarly extrinsic hedonic rewards.

In the interest of generalization, the present research would also benefit from testing our propositions on other, more “specialized,” populations such as salespeople, employees, and managers. Another open question that merits further inquiry is whether employing negative reinforcement (e.g., inducing penalties or framing incentives as losses rather than gains), will
lead to similar choices and behaviors. Deepening our understanding of when and why cash incentives “fail” and how nonmonetary rewards can better motivate behavior poses an important challenge for researchers and practitioners, with widespread implications for human welfare.

Conclusion

Our research casts doubt on the ubiquitous practice of using cash or monetary incentives to drive individuals to engage in desired behaviors and attain goals, thresholds, and quotas. We find that cash “disincentives” seem to evoke a compensation mindset that focuses people more on the outcome of attaining an incentive than on the process of completing the task and truly earning the incentive. Consequently, such a compensation mindset can blunt willingness to take risks or tolerate delay, stymie motivation to set higher goals or work on more challenging tasks, and even induce cheating behavior. Our research findings may, in turn, lead to the prediction that when individuals pursue careers or work with a focus on compensation (rather than infusing meaning into the work itself), they may end up avoiding risk or delay with respect to earnings, choose relatively less ambitious goals, settle for “safer” career paths, and, in extreme cases, perhaps resort to less ethical conduct to ensure sufficient payment—choices and behaviors that are likely detrimental to people and society in the long run.
REFERENCES


Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation,” 
*Psychological Bulletin*, 125(6), 627-668.

82(3), 203-213.

Dhar, Ravi and Klaus Wertenbroch (2012), “Self-Signaling and the Costs and Benefits of 

Dodson, Joe A., Alice M. Tybout, and Brian Sternthal (1978), “Impact of Deals and Deal 


Gino, Francesca and Lamar Pierce (2009), “The Abundance Effect: Unethical Behavior in the 

and Probabilistic Rewards,” *Psychological Bulletin*, 130(5), 769-792.

Goswami, Indranil and Oleg Urminsky (2017), “The Dynamic Effect of Incentives on Postreward 


FIGURE 1

STUDY 1G—SELF-REPORTED FOCUS ON ATTAINING THE INCENTIVE (VERSUS ENGAGING IN THE TASK)

NOTE—Figure 1 displays participants’ average self-reported focus on the outcome of receiving the reward (7) as opposed to the process of engaging in the puzzle task (1) as a function of incentive condition and participants’ choice of easy versus difficult puzzle. Error bars are standard errors (+/- 1 SEM).
FIGURE 2

2A: STUDY 3A—CHOICE SHARE OF EXERCISE INCENTIVE PROGRAM OFFERING THE SMALLER-CERTAIN (OVER LARGER-UNCERTAIN) REWARD

2B: STUDY 3B—CHOICE SHARE OF EXERCISE INCENTIVE PROGRAM OFFERING THE SMALLER-IMMEDIATE (OVER LARGER-DELAYED) REWARD
FIGURE 3

STUDY 5—PROPORTION OF PARTICIPANTS WHO “CHEATED” (PROVIDED THE EXACT SOLUTION) ON THE COUNTING ZEROS TASK

NOTE—Figure 3 displays the frequency of cheating on the Counting Zeros task as captured by the percentage of participants who provided the exactly correct solution to each table as a function of incentive type condition. The percentage of participants who provided the exact solution was higher in the cash incentive condition compared to the control condition or the hedonic reward condition for each table (table 1: 20% monetary vs. 11% control vs. 6% hedonic, $\chi^2(2) = 8.13, p = .017$; table 2: 8% vs. 1% vs. 5%, $\chi^2(2) = 4.61, p = .10$; table 3: 26% vs. 14% vs. 11%, $\chi^2(2) = 6.75, p = .034$; table 4: 24% vs. 12% vs. 10%, $\chi^2(2) = 6.84, p = .033$; table 5: 24% vs. 15% vs. 14%, $\chi^2(2) = 3.00, p = .22$).
WEB APPENDIX A: HEDONIC GIFT CATALOG

As seen by participants assigned to the hedonic incentive condition:

PROGRAM A

Duration: 1 month (4 weeks)
Terms: As part of the program, members are encouraged to walk at least 60,000 steps total each week.
Reward: For EACH week that a member meets or exceeds the target goal of 60,000 steps total, he/she will earn his/her choice of 1 reward (with retail value of $5) from the following gift catalog:

- A gift card to Starbucks Coffee
- A gift card to REI online (sporting equipment and outdoor gear)
- A box of gourmet chocolates (truffles with customizable flavors)
- A gift card to Macy's apparel
- An AMC movie theater gift card
- A Barnes and Noble gift card
- A Groupon "Spa Day" gift card
- A Groupon "Dinner Date" gift card
- An iTunes gift card
- A gift card to Pinkberry frozen yogurt
- An Amazon Kindle gift certificate (e-books)

PROGRAM B

Duration: 1 month (4 weeks)
Terms: As part of the program, members are encouraged to walk at least 60,000 steps total each week.
Reward: For EACH week that a member meets or exceeds the target goal of 60,000 steps total, he/she will be entered into a raffle that week with a 1 in 20 chance of earning his/her choice of 1 reward (with retail value of $100) from the following gift catalog:

- A gift card to Starbucks Coffee
- A gift card to REI online (sporting equipment and outdoor gear)
- Several boxes of gourmet chocolates (truffles with customizable flavors)
- A gift card to Macy's apparel
- An AMC movie theater gift card
- A Barnes and Noble gift card
- A Groupon "Spa Day" gift card
- A Groupon "Dinner Date" gift card
- An iTunes gift card
- A gift card to Pinkberry frozen yogurt
- An Amazon Kindle gift certificate (e-books)
WEB APPENDIX B: STUDY 1B METHOD AND RESULTS

Study 1b: Foreign Language Incentive Programs

Procedure. Study 1b tested whether cash incentives shift preferences toward smaller but guaranteed rewards using a different scenario of required effort and program goal. Participants consisted of 356 respondents, assigned to either a monetary or hedonic incentive condition, who were asked to choose which of two foreign language programs (labeled Program A and Program B) they preferred to join. Both programs lasted eight weeks and required members to take an exam at the end of each week covering the grammar and vocabulary taught in that past week. For each week a member passed the exam, s/he would earn an incentive denominated in either a cash (monetary incentive condition) or a noncash currency (hedonic incentive condition).

Participants who were randomly assigned to the monetary incentive condition read about Program A, which offered a smaller but certain reward ($5 in cash), followed by Program B, which offered a larger but uncertain reward (entry into a raffle with a 1 in 10 chance to earn $50 in cash). In contrast, for participants who were randomly assigned to the hedonic incentive condition, the smaller but certain reward consisted of the participant’s choice of one small hedonic reward (with retail value of $5) from a predetermined gift catalog, while the larger but uncertain reward consisted of an entry into a raffle with a 1 in 10 chance of earning the participant’s choice of one larger hedonic reward (with retail value of $50) from the same gift catalog. We counterbalanced the order of presentation of these two programs. As the primary dependent measure, we asked participants to choose the program they would rather join, assuming they could only enroll in one.

Results and discussion. Presentation order did not affect choice shares ($\chi^2(1) = .55, p = .46$) or interact with incentive condition to affect choice shares ($\chi^2(1) = .10, p = .75$). Collapsed
across presentation order and consistent with risk aversion, participants in both incentive conditions were more likely to choose the program with the smaller-certain reward over the program with the larger-uncertain reward (monetary condition: 77%, \( \chi^2(1) = 51.78, p < .001 \); hedonic condition: 68%, \( \chi^2(1) = 23.01, p < .001 \)). This tendency to prefer the smaller-certain (vs. larger-uncertain) reward was stronger among those in the monetary incentive condition compared to those in the hedonic incentive condition (\( \chi^2(1) = 3.60, p = .06 \)). The fact that a similar pattern of results arises for both the exercise and foreign language scenarios indicates that, consistent with our proposed compensation mindset, contingent cash incentives enhance the preference for guaranteed rewards despite the smaller amount earned.
WEB APPENDIX C: STUDY 1C METHOD AND RESULTS

Study 1c: Exercise Incentive Programs with a Greater Expected Value for the Uncertain Reward

Procedure. We randomly assigned 230 participants to either a monetary or hedonic condition. Participants faced the same scenario as in study 1a, in which they were asked to choose which of two exercise programs (Program A or Program B) they would rather join. Again, both programs lasted four weeks and encouraged members to walk at least 60,000 steps each week. For each week a member met or exceeded the target goal of 60,000 steps, s/he would earn an incentive denominated in either a cash (monetary incentive condition) or a noncash currency (hedonic incentive condition).

We adjusted the magnitude of the larger but uncertain reward such that its expected value was greater than that of the smaller but certain reward. Participants in the monetary incentive condition read about Program A, which offered a smaller but certain reward ($5 in cash), followed by Program B, which offered a larger but uncertain reward (entry into a raffle with a 1 in 20 chance to earn $120 in cash; i.e., expected value of $6). For those in the hedonic incentive condition, the smaller but certain reward consisted of the participant’s choice of one small hedonic reward (worth $5) from the gift catalog used previously, while the larger but uncertain reward consisted of an entry into a raffle with a 1 in 20 chance of earning the participant’s choice of one larger hedonic reward (worth $120) from the same catalog.

Results and discussion. As with the previous studies, choices overall reflected risk aversion, with participants in both incentive conditions being more likely to choose the program offering the smaller-certain reward over the program offering the larger-uncertain reward (monetary condition: 75%, $\chi^2(1) = 28.75, p < .001$; hedonic condition: 62%, $\chi^2(1) = 6.23, p = .013$). However, even when the expected value of the guaranteed alternative was lower, the
tendency to choose the smaller-certain reward over the larger-uncertain reward remained stronger among those in the monetary condition compared to those in the hedonic condition ($\chi^2(1) = 4.97, p = .026$).

Taken together, the results of studies 1a through 1c provide convergent evidence that relative to noncash hedonic rewards, cash incentives enhance preference for guaranteed (but lower magnitude) contingent rewards over probabilistic (but higher magnitude) ones.
WEB APPENDIX D: STUDY 1D POSTTEST

Procedure. To elicit a baseline measure of average step count, we surveyed a separate sample of 115 respondents from the same population and asked them to give their best estimate of how many steps they typically walk each week (i.e., across a period of seven days). We informed them that 10,000 steps is roughly equivalent to five miles. Next, participants read two different scenarios (order counterbalanced): In Scenario A, they imagined reading about an exercise program that encourages members to walk at least 30,000 steps total each week for a month (four weeks). Scenario B presented the same information except that the focal exercise program set a target goal of at least 75,000 steps each week. We asked participants after each scenario how feasible meeting the step goal would be for them (1 = Not at all feasible; 7 = Very feasible), as well as how likely they would be able to meet that goal (1 = Not at all likely; 7 = Very likely).

Results. Participants reported an average baseline step count of 29,825 steps (SD = 32,684). Turning to the scenario responses, a mixed-design 2 (scenario) × 2 (order of presentation) ANOVA revealed a main effect of an indexed measure of perceived feasibility of meeting the goal ($M_{30k\text{ steps}} = 5.47$ vs. $M_{75k\text{ steps}} = 4.42$; $F(1,113) = 56.63, p < .001$), no effect of presentation order ($F(1,113) = .22, p = .64$), and no order by perception difference interaction ($F(1,113) = .23, p = .63$). We also calculated for each participant a difference score given by the gap in perceived feasibility of meeting the goal across the two scenarios (i.e., subtracting the feasibility of the 75,000-step goal from that of the 30,000-step goal). The mean difference score was positive and significantly differed from zero ($M = 1.05, SD = 1.49, t(114) = 7.58, p < .001$), indicating greater perceived feasibility of the “easier” (i.e., 30,000-step) program. Taken together, these data verify the assumption that meeting a 30,000-step performance goal should be construed as considerably more feasible (if not guaranteed) than meeting a 75,000-step goal.
WEB APPENDIX E: STUDY 1D—DISTRIBUTION OF STATED STEP GOALS

The diagram shows the distribution of stated step goals across different step intervals, categorized into monetary and hedonic goals. The x-axis represents the step interval, while the y-axis shows the percentage of participants. The data is plotted as bars for each interval, with different colors indicating monetary (light shading) or hedonic (darker shading) goals. The intervals are labeled from "below 100" to "100k or above."
WEB APPENDIX F: STUDY 1F PROCEDURE

Study 1f: Specifying “Safer” Goals (Close-ended)

One hundred and fifty-seven (157) participants were randomly assigned to either a monetary incentive condition or a hedonic incentive condition. As in study 1e, all participants were asked to imagine that they were interested in joining an exercise incentive program and subsequently read about one such program (lasting four weeks). Program members were encouraged to walk “a certain number of steps each week that they set for themselves at the beginning” and would earn a reward for each week that they met or exceeded their self-specified target step goal.

In the monetary incentive condition, the reward consisted of $5 in cash, whereas in the hedonic incentive condition, it consisted of the participant’s choice of one item (with retail value of $5) from the same hedonic gift catalog used in previous studies. As the primary dependent measure, we asked participants to select a minimum weekly target step goal for themselves out of 11 options presented in a multiple-choice question. The options ranged from “5,000+ steps each week” to “100,000+ steps each week” in 10,000-step increments (apart from the gap between the first two options given by “5,000+ steps” and “10,000+ steps”).
WEB APPENDIX G: STUDY 1F—DISTRIBUTION OF SELECTED STEP GOALS

![Graph showing the distribution of selected step goals for monetary and hedonic goals.](image-url)
WEB APPENDIX H: STUDY 1G STIMULI

General instructions:

Cognitive Perceptions and Processes

Although we are all unique, we share many of the same cognitive processes. This task investigates the cognitive perceptions and processes people use to solve different types of puzzles.

Today you will be doing one of two different tasks belonging to a puzzle category. You will have a choice between these tasks.

In a moment you’ll be asked to **choose between two randomly selected tasks** to do related to cognitive perceptions.

- Incentive conditions:

  In a moment you’ll be asked to **choose between two randomly selected tasks** to do related to cognitive perceptions.

  You will also have the chance to **earn a BONUS REWARD depending on your performance**. The details of this bonus reward will vary from task to task.

  A researcher will contact you via Amazon MTurk within 3 days if you have earned the bonus reward.

Task instructions:

**CATEGORY: WORD SEARCH PUZZLES**

This puzzle category contains tasks where you will be asked to solve different word search puzzles, each with a broad category or topic (e.g., "Sports", "Animals," etc.).

Your goal is to **name as many "target words"** as you can in the word search puzzle you choose within a given amount of time. By target words, we mean valid English words hidden in the word search that belong to (i.e., are examples of) a given category.

The word search will display the total number of target words in that puzzle but NOT the words themselves.

Target words can be horizontal, vertical, or diagonal. They may be written either forwards or backwards, and letters may also be shared occasionally across words.
Sample preview:

The difficulty level of the word searches will range from easy to hard depending on the puzzle. The larger the grid size of the word search, the harder it is to find all the target words.

To give you a sense of what you might see, below is a sample word search with a difficulty rating of Moderate (10 x 10 grid):

Category: COLORS
# of target words: 10
Time limit: 9 minutes

In this example, the correct target words hidden in the puzzle are: "green", "black", "purple", "white", "blue", "orange", "red", "brown", "pink", and "silver".
Transition loading screen:

SELECTING WORD SEARCH PUZZLES
Word search choice:

- Control condition:

**WORD SEARCH PUZZLE M**

**TASK:** Name as many target words as possible (i.e., valid English words that belong to the specified category, e.g., "Colors") hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, **NOT** the target words themselves.

**DIFFICULTY RATING:** Easy

- Puzzle size: 8 x 8 grid
- # of target words: 10
- Time limit: 9 minutes

**WORD SEARCH PUZZLE R**

**TASK:** Name as many target words as possible (i.e., valid English words that belong to the specified category, e.g., "Colors") hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, **NOT** the target words themselves.

**DIFFICULTY RATING:** Hard

- Puzzle size: 14 x 14 grid
- # of target words: 10
- Time limit: 9 minutes
• Monetary incentive condition:

**WORD SEARCH PUZZLE M**

**TASK:** Name as many target words as possible (i.e., valid English words that belong to the given category) hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, NOT the target words themselves.

**DIFFICULTY RATING:** Easy

- Puzzle size: 8 x 8 grid
- # of target words: 10
- Time limit: 9 minutes

**BONUS REWARD RULES:**

If you are able to correctly identify at least 80% of the total target words, you will earn $5 in cash.

**WORD SEARCH PUZZLE R**

**TASK:** Name as many target words as possible (i.e., valid English words that belong to the given category) hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, NOT the target words themselves.

**DIFFICULTY RATING:** Hard

- Puzzle size: 14 x 14 grid
- # of target words: 10
- Time limit: 9 minutes

**BONUS REWARD RULES:**

If you are able to correctly identify at least 80% of the total target words, you will earn $10 in cash.
• Hedonic incentive condition:

WORD SEARCH PUZZLE M

**TASK:** Name as many target words as possible (i.e., valid English words that belong to the given category) hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, **NOT** the target words themselves.

**DIFFICULTY RATING:** *Easy*

- Puzzle size: 8 x 8 grid
- # of target words: 10
- Time limit: 9 minutes

**BONUS REWARD RULES:**

If you are able to correctly identify at least **80%** of the total target words, you will earn your choice of 1 reward (with retail value of $5) from the following electronic gift catalog:

- A gift card to Starbucks Coffee
- A gift card to Macy's apparel
- An AMC movie theater gift card
- A Barnes and Noble gift card
- A Groupon "Spa Day" gift card
- A Groupon "Dinner Date" gift card
- A gift card to Pinkberry frozen yogurt
- An Amazon Kindle gift certificate
WORD SEARCH PUZZLE R

TASK: Name as many target words as possible (i.e., valid English words that belong to the given category) hidden in the word search puzzle.

You will only see the total number of target words contained in the word search, NOT the target words themselves.

DIFFICULTY RATING: Hard

- Puzzle size: 14 x 14 grid
- # of target words: 10
- Time limit: 9 minutes

BONUS REWARD RULES:

If you are able to correctly identify at least 80% of the total target words, you will earn your choice of 1 reward (with retail value of $10) from the following electronic gift catalog:

- A gift card to Starbucks Coffee
- A gift card to Macy's apparel
- An AMC movie theater gift card
- A Barnes and Noble gift card
- A Groupon "Spa Day" gift card
- A Groupon "Dinner Date" gift card
- A gift card to Pinkberry frozen yogurt
- An Amazon Kindle gift certificate
Easy puzzle:

Category: **ANIMALS**  
# of target words: 10  
Time limit: **9 minutes**

Hard puzzle:

Category: **ANIMALS**  
# of target words: 10  
Time limit: **9 minutes**
**Target word solutions and timer:**

<table>
<thead>
<tr>
<th>Target word 1:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Target word 2:</td>
<td></td>
</tr>
<tr>
<td>Target word 3:</td>
<td></td>
</tr>
<tr>
<td>Target word 4:</td>
<td></td>
</tr>
<tr>
<td>Target word 5:</td>
<td></td>
</tr>
<tr>
<td>Target word 6:</td>
<td></td>
</tr>
<tr>
<td>Target word 7:</td>
<td></td>
</tr>
<tr>
<td>Target word 8:</td>
<td></td>
</tr>
<tr>
<td>Target word 9:</td>
<td></td>
</tr>
<tr>
<td>Target word 10:</td>
<td></td>
</tr>
</tbody>
</table>

0 7 5 2
Study 2b: Foreign Language Incentive Programs

Procedure. To test whether cash incentives shift preferences toward smaller but immediate rewards in a different context, study 2b repeated the paradigm used in study 2a using the language learning scenario. Participants consisted of 353 respondents, assigned to either a monetary or hedonic incentive condition, who were instructed to imagine that they were interested in joining a summer online language program to increase their knowledge of a foreign language. They subsequently chose between two such programs in their area (again labeled Program A and Program B, order counterbalanced). Each program was described to last two months (eight weeks) with a trial run of one week, and as part of the curriculum all members would take an exam at the end of each week. If a member passes the exam after the first week (trial run), s/he would earn a reward denominated in either cash (monetary condition) or noncash terms (hedonic condition). Program A granted a smaller incentive of $20 (in either cash or hedonic prizes; manipulated between-subjects) to be received immediately, while Program B offered a larger incentive of $30 (in either cash or hedonic prizes; manipulated between-subjects) to be received in two months after the trial run.

Results. Presentation order did not affect choice shares ($\chi^2(1) = .01, p = .93$) or interact with incentive condition to affect choice shares ($\chi^2(1) = 1.52, p = .22$). Whereas 53% of participants in the monetary incentive condition chose the program with the immediate but smaller reward over the program with the delayed but larger reward, only 38% of participants in the hedonic incentive condition chose the program with the immediate but smaller reward ($\chi^2(1) = 7.94, p = .005$).
WEB APPENDIX J: STUDY 4A—CHOICE SHARE OF INCENTIVE PROGRAM
OFFERING THE SMALLER BUT LESS UNCERTAIN (OVER LARGER BUT MORE
UNCERTAIN) REWARD

![Bar chart showing choice share of incentive program offering the smaller but less uncertain (over larger but more uncertain) reward.]

- Certainty present:
  - Monetary: 75%
  - Hedonic: 68%

- Certainty absent:
  - Monetary: 62%
  - Hedonic: 75%
WEB APPENDIX K: STUDY 4B—CHOICE SHARE OF INCENTIVE PROGRAM
OFFERING THE SMALLER BUT LESS DELAYED (OVER LARGER BUT MORE
DELAYED) REWARD

![Bar chart showing choice share of monetary and hedonic rewards with immediacy present and absent.]

- **Immediate present:**
  - Monetary: 69%
  - Hedonic: 51%

- **Immediate absent:**
  - Monetary: 54%
  - Hedonic: 57%
WEB APPENDIX L: STUDY 5 INSTRUCTION STIMULI

Task instructions:

INSTRUCTIONS (please read carefully!):

Your task is to count zeros in a series of tables. Below is an example of what you’ll see:

```
110011100101001100001011000010
01111101010001011001100000101
111101000001100100011100110
100010011110000100111000000
011001111001100110000000111
0001001001110000000111100011
011000111010110100000011000
111100011001000001101000100
11100000100010100100100100
01101000011000001110000010
00111000110000001101000000
01000101001111000110001000
11110000100110011000000011
00000110001110010100001100
01100111000011011000000100
```

Once you have entered your answer, a new table will be randomly generated.

To make this task a little more challenging, you will have 90 seconds (‘minute 30 seconds) to count each table. After 90 seconds, the page will automatically advance, but you can press the continue (>>) button at any time if you finish before time is up.

NOTE: Please try to count the zeros using just your eyes instead of with the help of external tools like the “find in page” search command.

NOTE—After entering their answer for each table, participants read that a new table would be randomly generated on the next page. This was done in the interest of task realism and to decrease any suspicion that the tables were “rigged” in any way. In actuality, all participants saw the same five tables.
Sample grid:

How many zeros are in the table?

<table>
<thead>
<tr>
<th>0100000110111101110110001110</th>
</tr>
</thead>
<tbody>
<tr>
<td>101001111011000010000010011101</td>
</tr>
<tr>
<td>011100011100001100000010101001</td>
</tr>
<tr>
<td>0111101011011000110110111110</td>
</tr>
<tr>
<td>100001010100001110111010100110</td>
</tr>
<tr>
<td>110101010101011110101100011</td>
</tr>
<tr>
<td>11111010001100111101111111</td>
</tr>
<tr>
<td>1000010111001011110111001100</td>
</tr>
<tr>
<td>01110101100111011010001110100</td>
</tr>
<tr>
<td>01001110011110111111111111</td>
</tr>
<tr>
<td>1110011100111010111100101110100</td>
</tr>
<tr>
<td>01011011111101111111111110</td>
</tr>
<tr>
<td>10100011000100010001001011100</td>
</tr>
<tr>
<td>10101010100010111001111011010</td>
</tr>
<tr>
<td>011110110100110001111111110001</td>
</tr>
</tbody>
</table>

# of zeros
WEB APPENDIX M: STUDY 5 POSTTEST

Study 5 posttest: The Effect of Cash Incentives on Performance when Cheating is Prevented

Procedure. To rule out the alternative explanation that people in the cash incentive condition counted more tables correctly because they were truly working harder, we conducted a study that removed the opportunity to cheat. Participants consisted of 280 respondents who completed the same procedure used in study 5 with the exception that they could not feasibly cheat on the task, because each table was presented as an image pasted on the screen that was not searchable using the “find in page” (or “CTRL+F” command) command. As a result, participants could only “manually” count the number of zeros in each table (by visually inspecting the table, i.e., actually investing effort without cheating). We imposed the same time limit of 90 seconds per table before the screen automatically advanced.

Results and discussion. Again, we calculated for each participant a score given by the total number of tables counted (exactly) correctly. No effect of incentive type or condition emerged for this measure ($F(2,277) = .41, p = .66$): As expected, those in the cash incentive condition gave equally few correct solutions ($M = .14, SD = .47$) as did those in the control condition ($M = .07, SD = .25$) or in the hedonic reward condition ($M = .16, SD = .76$). Note that these averages are lower compared to those in each of the corresponding incentive conditions in study 5, indicating that participants there likely cheated across the board when the opportunity to do so was present. In other words, the difference we observed in study 5 as a function of incentive type occurred on the intensive margin (i.e., amount or degree of cheating) rather than on the extensive margin (i.e., whether any cheating occurred in the first place).
WEB APPENDIX N: STUDY 6 STIMULI

Task instructions:

INSTRUCTIONS (please read carefully!):

Your task is to unscramble a series of jumbled words on a page in a given amount of time.

By unscramble, we mean rearrange the letters so that the resulting word forms a (valid) English word containing all the letters of the original scrambled word.

SCORING:

You will earn 10 points for each word jumble you report successfully solving in order from the beginning.

This means you should try to solve the jumbles in the order they appear. So, for example, if you successfully unscramble the first 3 word jumbles but not the 4th, you will earn points only for the first 3—even if you also successfully unscramble the 5th, 6th, and 7th word jumbles.

After you unscramble each word jumble, please check the "Solved" button to indicate that you have solved the word jumble. (If you have not solved it, check the "not solved" button.)

Use only your mind, and no other tools, to solve the jumbles.
**Bonus instructions** (monetary and hedonic incentive conditions only):

- Monetary incentive condition:

  **Bonus reward rules** (please read carefully!)

  As a bonus reward, if your total score falls in the top 5% of participants completing this study today, you will earn an additional **$30** in cash (through MTurk).

- Hedonic incentive condition:

  **Bonus reward rules** (please read carefully!)

  As a bonus reward, if your total score falls in the top 5% of participants completing this study today, you will earn your choice of 1 reward (with retail value of $30) from the following electronic gift catalog:

  - A gift card to Starbucks Coffee
  - A gift card to Macy's apparel
  - An AMC movie theater gift card
  - A Barnes and Noble gift card
  - A Groupon "Spa Day" gift card
  - A Groupon "Dinner Date" gift card
  - A gift card to Pinkberry frozen yogurt
  - An Amazon Kindle gift certificate

  We will send a message through MTurk within 2 days if you have earned the bonus reward, with a link or redemption code to claim it.
Anagram task with displayed timer:

Please unscramble each of the word jumbles below.

After you unscramble a word jumble, please check the "Solved" button to indicate that you have solved the word jumble. (If you have not solved it, check "Not solved").

Keep in mind that you will receive 10 points for each word jumble you solve in order from the beginning.

Click continue after you have finished or 7 minutes have elapsed (timer below). After 7 minutes, the page will automatically advance.

1. UNHTED
   Not solved
   Solved

2. EOSHU
   Not solved
   Solved

3. UNAAGT
   Not solved
   Solved

4. YTHOIRD
   Not solved
   Solved
5. O L A R C
Not solved
Solved

6. J N I P M U G
Not solved
Solved

7. H G I T W E
Not solved
Solved

8. C L A L S O U
Not solved
Solved

9. Y O M S E E V L D
Not solved
Solved

0649
WEB APPENDIX O: STUDY 6 METHOD AND RESULTS

Study 7: Marble Guessing Game

Study 7 aimed to replicate the findings of studies 5 and 6 using a different paradigm.

Procedure. Participants consisted of 321 respondents, randomly assigned to one of three incentive conditions (no-incentive control vs. cash incentive vs. hedonic reward). Participants were asked to complete an online survey ostensibly about how people “visually perceive objects.” We told participants that to help us test this cognitive process, they would be playing a “marble guessing game” that involves estimating how many marbles appear in a series of cubes, or “boxes.”

Specifically, participants read that they would see a series of five boxes, each with a “randomly generated number of marbles (represented by colored spheres) inside,” and that their task is to estimate the number of marbles in each box. (In actuality, we presented everyone with the same stimuli.) Participants were told that they would have 15 seconds to examine each box and type their answer before the screen automatically advanced. A timer counting down from 15 seconds would be displayed on each page. Further, we informed participants that we will provide feedback after they give a response for each box (i.e., their own guess and the correct answer), and to therefore “please make sure to take notes somewhere separately in order to keep track of how many points you scored (if any) based on that feedback.”

All participants read that their score would be determined by how many points they receive for each box, according to the following distribution: Each exactly correct answer (i.e., if they guess the exact number of marbles depicted) would give them 20 points; each answer within 10, 20, and 30 marbles from the actual number depicted would give them 10 points, 5 points, and
1 point, respectively; and all other responses would award no points. We included two questions about the scoring system as a comprehension check.

After reading the instructions, participants assigned to the control condition proceeded to the focal task (for which they received a baseline fee of $0.80, regardless of their performance). Those assigned to each of the other two conditions read that they had the opportunity to earn a reward (on top of the baseline participation fee of $0.80) depending on their performance on the marble guessing game—specifically, if they scored within the top 10% of all participants in the study. In the cash incentive condition, this incentive consisted of $10 in cash, while in the hedonic reward condition it consisted of the participant’s choice of one item (with retail value of $10) from the same hedonic gift catalog used in previous studies. Those in the hedonic reward group chose one item from the catalog as their preferred reward.

Participants had the opportunity to “cheat” by misreporting their performance toward the end of the survey. In particular, after they completed the marble guessing game, all participants saw a “final score calculation” page displaying their guesses for each of the five boxes, along with a reminder of the scoring rules (i.e., how many points they would gain if their estimate fell within 0, 10, 20, and 30 marbles from the true answer). As the primary dependent measure, we asked participants to state in writing how many points they earned for each box. That is, participants read that “since the actual correct answers to the specific boxes you saw were not recorded as part of this survey for technical reasons,” and participants were told that they should fill out the table with their points scored to the best of their recollection as they kept track during the task (i.e., based on the feedback given). In the cash incentive condition and in the hedonic reward condition, we further emphasized to participants that whether they earn the incentive ($10 cash or their selected hedonic prize of equivalent retail value, respectively) will depend on the
total score calculated based on their self-reported points. Note that we designed the task to be sufficiently challenging given the time constraint (only 15 seconds allotted per estimate) and large number of marbles depicted (167, 97, 221, 182, and 288 marbles in the boxes, in each of the five boxes, respectively). Compounded with the visual clutter of the boxes (i.e., marbles overlapped with each other to make counting each one very difficult), the design of the task ensured that identifying the exact number of marbles in any given box would be exceedingly unlikely. A well-educated guess could, however, fall within wider margins of error, such as the 10, 20, or 30 marbles range; less precise estimates would in turn offer diminishing returns (i.e., fewer points which in turn translate to a lower chance of scoring in the top 10% of participants).

Unbeknownst to participants, we kept a record of each individual’s responses relative to the correct solution. This allowed us to objectively measure cheating as given by the amount of points reported over and above the true score. Finally, participants completed basic demographic questions; those in the two incentive conditions (cash incentive and hedonic reward) who scored in the 90th percentile (top 10%) received the relevant incentive.

Results and discussion. We report results for the untransformed data (a nonparametric analysis yielded similar results). Participant’s actual scores did not differ significantly across the three conditions ($M_{\text{control}} = 3.16$ [$SD_{\text{control}} = 4.46$]; $M_{\text{monetary}} = 5.22$ [11.53]; $M_{\text{hedonic}} = 3.21$ [4.57]; $F(2,318) = .98, p = .38$), indicating that participants performed equally poorly across the three conditions. For each participant, we computed a deviation measure by subtracting that participant’s total true score—i.e., points accumulated across the five rounds—from the total number of points that they reported for themselves. A positive deviation score hence indicates the likely presence of cheating (i.e., through overreporting own performance), with higher positive scores indicating a greater magnitude of cheating.
The total amount of points overreported across the five boxes—that is, the amount of cheating—varied by incentive group ($M_{\text{control}} = 9.70$ [SD = 18.23]; $M_{\text{monetary}} = 16.98$ [28.75]; $M_{\text{hedonic}} = 11.14$ [23.07]; $F(2,318) = 2.88, p = .058$). In particular, a planned contrast revealed that participants assigned to the cash incentive condition overreported more total points than did those assigned to the control ($t(318) = 2.27, p = .024$) and (albeit less so) those assigned to the hedonic reward condition ($t(318) = 1.79, p = .075$), which did not differ between each other ($t(318) = .44, p = .66$). Participants who faced cash incentives hence “cheated” more compared to those in the other two incentive conditions combined ($t(318) = 2.35, p = .019$).

However, the above pattern of results appears to be driven primarily by a greater magnitude of cheating conditional on having cheated at all (i.e., on the intensive margin) rather than a greater incidence of having cheating at all. In particular, we coded each participant’s responses according to whether the participant overreported his/her score by any positive amount for a given box. The proportion of participants who cheated at all did not differ by condition for any box (box 1: $\chi^2(2) = 3.78, p = .15$; box 2: $\chi^2(2) = 2.85, p = .24$; box 3: $\chi^2(2) = 1.26, p = .53$; box 4: $\chi^2(2) = 1.85, p = .40$; box 5: $\chi^2(2) = 2.68, p = .26$), nor did it differ in a repeated-measures analysis across all five boxes.

The total amount of points overreported conditional on having overreported at all varied by incentive group ($M_{\text{control}} = 15.67$ [SD = 20.12]; $M_{\text{monetary}} = 28.01$ [31.72]; $M_{\text{hedonic}} = 17.33$ [25.52]; $F(2,209) = 4.62, p = .01$). Specifically, participants randomly assigned to the cash incentive condition overreported their points by a higher margin compared to those assigned to the control condition ($t(209) = 2.81, p = .005$) and to the hedonic reward condition ($t(209) = 2.42, p = .017$), which did not differ from each other ($t(209) = .38, p = .71$). Again, participants
who faced cash incentives “cheated” more compared to those in the other two incentive conditions combined ($t(209) = 3.01, p = .003$).

Finally, as an approximate baseline measure of noise that partially captures the extent to which people may have forgotten or misjudged their true performance, we calculated for each individual whether s/he underreported his/her scores. The proportion of participants who underreported their scores remained low for each box overall and did not vary as a function of incentive condition (box 1: 2% control vs. 0% monetary vs. 0% hedonic; box 2: 0% control vs. 2% monetary vs. 2% hedonic; box 3: 4% control vs. 3% monetary vs. 5% hedonic; box 4: 11% control vs. 10% monetary vs. 12% hedonic; box 5: 3% control vs. 1% monetary vs. 1% hedonic; all $ps > .1$).

The above findings provide additional evidence for the hypothesis that cash incentives, relative to noncash hedonic rewards or a no-incentive control condition, incite greater cheating. Apparently, a compensation mindset can privilege attaining cash above ethical concerns involved in how that cash is “earned.”
STUDY 7—PROPORTION OF PARTICIPANTS WHO OVERREPORTED ANY POINTS

STUDY 7—POINTS OVERREPORTED AMONG THOSE WHO OVERREPORTED AT ALL

NOTE—All error bars are standard errors (+/- 1 SEM).
**Task instructions:**

**Marble Guessing Game**

INSTRUCTIONS (please read carefully!)

In a moment, you will see a series of 5 boxes, each with a randomly generated number of marbles (represented by colored spheres) inside. Here's an example of something you might see—in this case, there are 20 marbles:

Your task is to give your best estimate of how many marbles are in each box.

You will only have 15 seconds to examine each box and type your answer in the form provided before the page automatically moves forward. (You will see a 15-second timer on each page.)

**IMPORTANT NOTE:** We will provide feedback after you give a response for each box, so please make sure to take notes somewhere separately in order to keep track of how many points you scored (if any) based on that feedback.

**Scoring instructions:**

Your score on this task will be determined by how many points you receive for each box:

- Each exact answer (i.e., if you guess the exact # of marbles depicted): +20 points
- Each answer within 10 marbles (i.e., between 1-10) from the actual #: +10 points
- Each answer within 20 marbles (i.e., between 11-20) from the actual #: +5 points
- Each answer within 30 marbles (i.e., between 21-30) from the actual #: +1 point
- All other responses: 0 points
Comprehension check:

Before you proceed to the task, just a couple of questions to make sure the instructions were clear...

The scoring rules are reproduced below for your reference:

- Each *exact* answer (i.e., if you guess the *exact* # of marbles depicted): +20 points
- Each answer within 10 marbles (i.e., between 1-10) from the actual #: +10 points
- Each answer within 20 marbles (i.e., between 11-20) from the actual #: +5 points
- Each answer within 30 marbles (i.e., between 21-30) from the actual #: +1 point
- All other responses: 0 points

If there are 64 marbles in a box and you guess 74, how many points would you receive for that box?

- 1 point
- 2 points
- 5 points
- 10 points
- 20 points
- 0 points

If there are 233 marbles in a box and you guess 230, how many points would you receive for that box?

- 1 point
- 2 points
- 5 points
- 10 points
- 20 points
- 0 points
Sample marble estimation question:

![Box of marbles]

Loading page (transition):

Feedback:

YOUR GUESS: **300**  
ACTUAL #: **221**  
Press >> to proceed.
WEB APPENDIX P: STUDY 8 METHOD AND RESULTS

Study 8: People Prefer Cash Incentives and Think They Are More Motivating

Rather than varying the incentive type (cash vs. hedonic) between-subjects as we did for studies 1a-1c, here we directly juxtaposed the two currencies for each participant. We also introduced a second factor in which both alternatives offered either a certain or probabilistic incentive to test whether the probability of earning the incentive matters when choosing between cash-based versus hedonic reward programs.

Procedure. Participants consisted of 339 respondents randomly assigned to one of two “presence of certainty” conditions (either “both options certain” or “both options uncertain”). Following the procedure in the risky choice series of studies, we asked participants to consider to the same exercise scenario where they could choose between two such programs (A and B). Both programs were advertised as lasting one month (four weeks), and both encouraged members to walk at least 60,000 steps in total each week. For each week a member meets or exceeds the target goal of 60,000 steps, s/he would earn a reward.

Unlike the previous studies, however, participants here chose directly between programs with different incentive currencies: one denominated in cash and one denominated in hedonic terms. Specifically, participants randomly assigned to the “both options certain” condition faced a choice between Program A, which awarded members who met the step goal with $5 in cash, and Program B, which awarded them with their choice of a hedonic reward (with retail value of $5) from the gift catalog used in previous studies. By contrast, participants in the “both options uncertain” condition chose between Program A, which offered eligible members a 1 in 20 chance of earning $100 in cash, and Program B, which offered them a 1 in 20 chance of earning their choice of a hedonic reward (with retail value of $100). We counterbalanced the order of
presentation of the two incentive programs. After choosing the program they preferred to join, participants indicated which of the two programs they believed would motivate them to walk more steps (i.e., expend more effort).

**Results.** Examining first the responses to the enrollment preference measure, we found that participants were more likely to choose the cash incentive program when it was listed first compared to second (86% vs. 78%; $\chi^2(1) = 3.89, p = .049$), although presentation order did not interact with the “presence of certainty” factor to affect choice shares ($\chi^2(1) = .25, p = .62$). The chosen incentive program also did not vary based on presence of certainty: 80% and 85% in the “both options certain” and “both options uncertain” groups, respectively, chose the cash incentive program over the hedonic reward program ($\chi^2(1) = 1.74, p = .19$). Notably, the vast majority of participants had a strong preference to join the program offering the cash incentive rather than the hedonic reward, with 83% preferring the former over the latter ($\chi^2(1) = 146.69, p < .001$).

Presentation order did not affect responses on the perceived motivation measure ($\chi^2(1) = 2.64, p = .10$), although participants were slightly more likely to select the cash incentive program as the more motivating of the two when it was listed first (85%) rather than second (80%). Whether the incentives were presented in certain or probabilistic terms did not affect choice shares of the program offering the cash incentive as the more motivating program: 81% and 85% in the “both options certain” and “both options uncertain” groups, respectively, indicated the cash-based program as being more motivating ($\chi^2(1) = 1.74, p = .19$), nor did condition interact with presentation order to affect choice shares on this measure ($\chi^2(1) = .013, p = .91$). Paralleling the responses for enrollment preference, participants were considerably more likely to identify the cash incentive program as more motivating than the hedonic reward program, with 83% favoring the former ($\chi^2(1) = 149.34, p < .001$).