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Negativity Bias and Task Motivation: Testing the Effectiveness of Positively Versus Negatively Framed Incentives

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People are frequently challenged by goals that demand effort and persistence. As a consequence, philosophers, psychologists, economists, and others have studied the factors that enhance task motivation. Using a sample of undergraduate students and a sample of working adults, we demonstrate that the manner in which an incentive is framed has implications for individuals' task motivation. In both samples we find that individuals are less motivated when an incentive is framed as a means to accrue a gain (positive framing) as compared with when the same incentive is framed as a means to avoid a loss (negative framing). Further, we provide evidence for the role of the negativity bias in this effect, and highlight specific populations for whom positive framing may be least motivating. Interestingly, we find that people's intuitions about when they will be more motivated show the opposite pattern, with people predicting that positively framed incentives will be more motivating than negatively framed incentives. We identify a lay belief in the positive correlation between enjoyment and task motivation as one possible factor contributing to the disparity between predicted and actual motivation as a result of the framing of the incentive. We conclude with a discussion of the managerial implications for these findings.

Keywords: negativity bias, motivation, mis-prediction, incentives

Questions of how to motivate behavior with rewards have preoccupied scholars across a variety of different disciplines. Such questions are both academically interesting as well as practically relevant. Educators and parents must identify the strategies they will use to encourage children to work hard, and managers must determine the incentive structures they will put in place to promote performance among their employees. Further, some individuals engage in self-motivation by designing and implementing their own reward structures (The Economist, 2008). These examples converge with prior research to suggest that it is common for people to rely on extrinsic incentives for motivation. In spite of this, however, debate exists surrounding whether or not such incentives are effective (Eisenberger, Pierce, & Cameron, 1999; Gagne & Deci, 2005; Greene, Sternberg, & Lepper, 1976), with many finding inconclusive results (e.g., Bonner & Sprinkle, 2002). This raises interesting and important questions as to whether and how extrinsic incentives can be structured in order to enhance motivation.

The current research addresses this issue by testing whether the framing of an extrinsic reward, as positive versus negative, affects

motivation. For example, consider an individual who has to perform a series of tasks to meet her goal. In one scenario she learns that she will receive \$25 for each task that is successfully completed, for a maximum payment of \$200. In another scenario she is given \$200 at the outset and is told that \$25 will be deducted for each task that is *not* successfully completed. Under both incentive frames the goal is identical (completing a set of tasks) and the incentive is the same (\$25 for each successfully completed task). We draw from research in a variety of academic domains (i.e., behavioral decision theory, behavioral economics, social psychology) to posit that positively framed incentives will be less motivating than negatively framed incentives due to a negativity bias in information processing.

Work on the negativity bias demonstrates that negative information exerts a greater influence on behaviors and cognitions than comparable positive information (Cacioppo & Berntson, 1994; for review see Baumeister, Finkenauer, & Vohs, 2001). For example, humans are slower to adapt to negative life events than positive life events (Brickman, Coates, & Janoff-Bulman, 1978). The distress experienced when losing a sum of money exceeds the joy that is experienced when an equivalent amount is gained (Kahneman & Tversky, 1984), and negative information (e.g., information emphasizing the negative consequences of not engaging in a health-related behavior) is generally more persuasive than positive information (e.g., information stressing the positive benefits of engaging in a health-related behavior; Meyerowitz & Chaiken, 1987). Based on these findings, we posit that individuals will be less motivated by an incentive that allows them to accrue a gain (positive framing) as compared with an incentive that allows them to avoid a loss (negative framing).

However, if the effect of incentive framing is driven by a negativity bias as we predict, we should observe certain theoretic-

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cally relevant boundary conditions. Specifically, the effect of incentive framing on motivation should attenuate with age. This prediction is based on research that, while confirming the validity of the negativity bias, reveals that one's likelihood of demonstrating this bias decreases with age (Mather & Carstensen, 2005). For example, although among younger adults, extreme negative images produce greater brain activation than equally extreme positive images (Ito et al., 1998), this effect is eliminated among older adults (Wood & Kisley, 2006). Further, attention to negative, but not positive, stimuli declines with age (Isaacowitz, Wadlinger, Goren & Wilson, 2006), and memory for positive, but not negative, events increases with age (Kennedy, Mather & Carstensen, 2004; Mather & Carstensen, 2005). Therefore, if a negativity bias underlies the predicted effect of incentive framing on motivation, we should observe that the effect of incentive framing on motivation should be moderated by the age of the participants. Said otherwise, positively framed incentives should be less motivating than negatively framed incentives for younger, but not older, participants. Through testing this, we shed light on the process underlying why positively framed incentives may be less motivating than negatively framed incentives and suggest specific populations for whom different incentive frames may be most effective.

We do so in a series of experiments involving undergraduate students and working adults. These populations were chosen for two reasons. First, these populations were chosen because financial rewards are commonly implemented to incentivize performance in both academic and employment settings. Undergraduate students frequently have the opportunity to earn merit based scholarships or other rewards for their scholastic achievements (Crotty, 2013; Fryer, 2011; Ripley, 2010), just as employees are regularly offered financial incentives to motivate their performance (for review see Locke et al., 1980). As a consequence, inquiry into the factors that increase the efficacy of incentives in these contexts has both theoretical and practical relevance. Second, testing for the predicted effects on different populations allows us to test the robustness of our results and to provide informed suggestions regarding when using positively versus negatively framed incentives may be most successful.

Across our experiments, we find consistent support for our prediction that motivation is lower when the incentive is framed positively as opposed to negatively. Interestingly, we observe this pattern although negatively framed incentives are seldom observed in the marketplace, in comparison with positively framed incentives, such as bonuses, which are employed regularly. We draw from research in the domain of hedonic forecasting to argue that one reason that positively framed incentives may be frequently used is that educators and managers might predict they would be more effective than negatively framed incentives.

Research in the domain of preferences has extensively demonstrated that people often hold incorrect intuitive predictions of what they will choose or how they will feel in given future scenarios (Gilbert et al., 2004; Loewenstein, 2000; Wang, Novemsky, & Dhar, 2009). Xu and Schwarz (2009) find that these errors in prediction are often attributable to people relying on lay theories about behavior when predicting their choices and feelings. We argue that people will likewise be prone to rely on lay theories about behavior when predicting how motivated they will be. In particular, we argue that when predicting future motivation, people will rely on a lay theory that enjoyment and task motivation are

positively correlated. Research in the domain of organizational motivation has demonstrated that this lay belief is widely endorsed. Specifically, this research suggests that there is a widespread lay belief that "happy" workers are more motivated and productive (Fisher, 2003). Building on these findings, we posit that when asked to predict whether a negatively framed incentive or a positively framed incentive will be more motivating, people will incorrectly predict that the positively framed incentive will be more motivating, specifically because gains are associated with greater enjoyment. Said otherwise, we argue that predictions of how incentives will affect motivation will be biased because people will rely on a lay theory that enjoyment positively correlates with motivation. Understanding the disparity between predicted and actual motivation is important because in many real world situations, such as the classroom and the workplace, incentive structures are chosen based on people's intuitive predictions (Heath, 1999).

The remainder of the article is organized as follows: First, we test for the proposed effect of incentive framing on motivation by systematically manipulating the way in which a real financial incentive is framed and assessing participants' actual motivation on an assigned task. We test for these effects first on a sample of undergraduate students and next using a diverse sample of working adults. Next, we examine how the actual effect of incentive framing compares to people's predictions in order to assess the accuracy of people's intuitive predictions about motivation. We conclude by discussing the theoretical and managerial implications for these findings.

Experiment 1: The Effect of Incentive Framing on Motivation Using an Undergraduate Sample

Method

The participants were 62 undergraduate students at a North American university. The survey was administered to participants individually. To minimize experimenter intervention, no demographic information was collected.

The experiment used a between-participants design where participants were randomly assigned to receive a positively framed performance incentive (hereafter, positive frame condition) or a negatively framed performance incentive (hereafter, negative frame condition). All participants were then given the same pencil and paper task, designed to test their motivation.

The task instructions informed participants that they were to unscramble a series of anagrams (described as "word jumbles"). All participants then saw an example of an anagram ("ETKBAS") and its correct answer ("BASKET"). Participants in the positive frame condition then read the following: "In order to encourage you to do your best, we will give you \$0.25 for every jumble that you correctly unscramble. If you correctly unscramble each jumble, you will receive \$1.50." Participants in the negative frame condition read, "In order to encourage you to do your best, we will give you \$1.50 before you begin. This is the amount you will receive if you correctly unscramble each jumble. When you tell us that you are done, we will take back \$0.25 for every jumble that you do not correctly unscramble." These instructions were written such that all participants were aware of the maximum possible gain

(\$1.50) as well as the monetary reward for each anagram that was correctly solved (\$0.25). Participants in the negative frame condition were given \$1.50 in quarters before their participation. All participants were told that there was no limit on the time they might take and that they should inform the experimenter whenever they wished to stop working.

Once participants had read and understood the instructions, they began the task, unaware that the experimenter was keeping time. All participants were given the same set of six anagrams. Four of these anagrams were intended to be of varying difficulty but solvable by most participants (OOLSCH, SEUMO, DINSLA, TALLOP). Embedded within these four anagrams were two extremely difficult anagrams that were intended to be unsolvable (FABELY, UDARIVMIQU). Though these anagrams could be used to form English language words (labefy, quadrivium), a pretest indicated that neither word was familiar to participants drawn from the same pool. These unsolvable anagrams were included because time spent persisting on unsolvable anagrams is commonly used as a measure of motivation (e.g., Elliot & Harackiewicz, 1996; Shah, Higgins, & Friedman, 1998; Wu, Heath & Larrick, 2008).

When the participant signaled to the experimenter that they wished to stop work on the task, their elapsed time was recorded. The participant then either received \$0.25 for each correctly unscrambled anagram (positive frame condition) or remitted \$0.25 for each incorrect answer or unsolved anagram (negative frame condition). Lastly, each participant was thanked and debriefed. No participant guessed the purpose of the study.

Results

We predicted that positively framed incentives would be less motivating than negatively framed incentives of equal value. In support of this prediction, participants in positive frame condition persisted for significantly less time ($M_{Positive} = 9.55$ minutes, $SD = 6.51$) than those in the negative frame condition ($M_{Negative} = 15.27$ minutes, $SD = 9.98$; $F(1, 61) = 7.10$, $p = .01$, $d = .68$, see Figure 1). Because performance on the four solvable anagrams was roughly equivalent across the two conditions ($M_{Negative} = 3.43$, $SD = 1.00$; $M_{Positive} = 3.42$, $SD = 1.01$; $p > .9$), this suggests that the difference in time spent was attributable to persistence on the unsolvable anagrams.

These findings demonstrate that positively framed incentives were less effective than negatively framed incentives at motivating undergraduate students. We argue that this effect occurred because of a negativity bias in information processing. If this explanation is correct, such effects should be particularly pronounced among younger individuals, because the negativity bias is attenuated with age (Kisley, Wood & Burrows, 2007; Mather & Carstensen, 2005; Wood & Kisley, 2006). Experiment 2 tests for the effect of incentive framing on motivation using a national panel of working individuals whose ages varied (range: 18–76). Doing so allows us to test whether the pattern of results observed in Experiment 1 extends beyond undergraduate populations to working adults more generally, in addition to testing for evidence of the underlying psychological mechanism.

Experiment 2: The Effect of Incentive Framing on Motivation Using a National Panel

Method

The participants were 268 individuals from Amazon's Mechanical Turk online participant pool (58% male; $M_{age} = 27.91$, $SD = 9.91$). Participants were given \$0.50 for their participation, in addition to any monies earned based on task performance. The experiment used a between-participants design where the framing of the incentive (positive frame condition vs. negative frame condition) was the manipulated factor.

All participants received instructions informing them that they would be given four anagrams to unscramble (the anagrams were described as "word jumbles"). They then saw an example of an anagram ("ETKBAS") and its correct answer ("BASKET"). Participants in the positive frame condition then read the following: "In order to encourage you to do your best, we will give you \$0.02 for every jumble that you correctly unscramble. There are four possible words that can be made from the four letter strings. If you correctly unscramble all four, you will receive \$0.08." Participants in the negative frame condition read, "In order to encourage you to do your best, we have already given you \$0.02 for every jumble that you correctly unscramble. There are four possible words that can be made from the four letter strings. This means you have already been allocated an extra \$0.08. For every word that you do not correctly identify, we will take back \$0.02." The instructions were written such that all participants were aware of the maximum possible gain (\$0.08), the number of correct solutions (four) as well as the monetary incentive per anagram (\$0.02). Further, in this experiment, all participants received this information in the same order to minimize the possibility of different anchoring effects across conditions. Note that the incentives used in this experiment were lower in value (\$0.02 per anagram) to reflect the standard compensation expectations of Amazon's Mechanical Turk workers. The average per hour wage of a Mechanical Turk

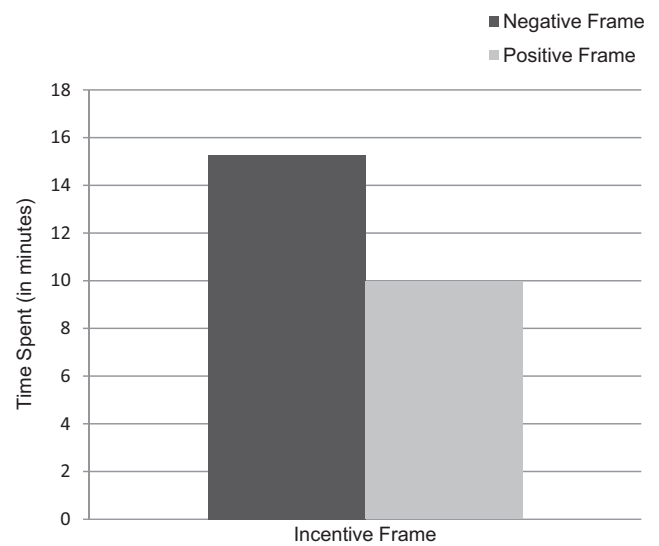


Figure 1. Experiment 1: Results—the effect of incentive framing on persistence (time spent).

worker is less than \$3.26 (Horton & Chilton, 2010) with many workers participating in studies for only a few cents (Harris, 2009).

Participants were told that each letter string would appear on a single screen. If they could not form a word with the letters or did not wish to continue working on a word they could click a button to advance to the next screen. Participants in both conditions were given the same set of four anagrams. Three of these anagrams were intended to be of varying difficulty but solvable by most participants (OOLSCH, SEUMO, DINSLA). The final anagram was an unsolvable anagram (UDARIVMIQU). Time spent persisting on the unsolvable anagram was recorded by a timer unseen to participants. This measure served as the main dependent variable.

After the anagram task, participants completed a series of additional measures. First, participants rated how atypical the incentive was on three measures (“The way I was paid was relatively standard, I have been paid like this before” [reverse coded], “The way I was paid was different, people usually don’t pay me this way,” and “This was a novel or unique form of payment”; all scales anchored at 1—*strongly disagree* and 7—*strongly agree*). This was done to address the alternate account that negatively framed incentives are more motivating because they are more unusual, and hence receive greater attention, than positively framed incentives. If so, perceptions of the incentive’s atypicality should mediate the effect of incentive framing on motivation.

Next, participants were asked to indicate whether the way in which they were paid was fair (scale: 1—*strongly disagree* and 7—*strongly agree*) and how much they liked participating in the study (scale: 1—*not at all* to 7—*very much*). These measures were taken to provide a preliminary test of whether negatively framed incentives could lead to negative downstream consequences (e.g., employee dissatisfaction). In addition, participants completed established measures of perceived socioeconomic status (SES) developed by Griskevicius and colleagues (2011). Specifically, they completed a three-item childhood-SES scale ($\alpha = .847$) and a three-item current-SES scale ($\alpha = .876$). As in prior work (Griskevicius et al., 2011; 2013), the childhood- and current-SES measures were correlated ($r = .45$); however, factor analysis indicated that these variables were empirically distinct. Finally, participants reported their gender and age.

Upon the completion of the experiment, participants’ responses were analyzed to determine the number of anagrams each participant correctly solved. Participants were sent an additional \$0.02 per anagram correctly solved through the Amazon Mechanical Turk website. Because of the nature of the online panel, these additional monies could not actually be allocated to participants in the negative frame condition in advance of their experimental participation. This modification provided a stronger test of the effect of incentive framing on motivation, as it controlled for the effects of any factors other than the incentive framing manipulation (e.g., the salience of money).

Results

Task persistence. The main dependent measure in this experiment was the time participants spent persisting on the unsolvable anagram. An analysis of variance test revealed that participants in the positive frame condition persisted for significantly less time on the unsolvable anagram than those in the negative frame condition ($M_{Positive} = 51.56$ seconds, $SD = 48.99$, $M_{Negative} = 66.28$

seconds, $SD = 61.02$; $F(1, 267) = 4.605$, $p = .033$, $d = .26$). Thus, the results of Experiment 1 were replicated using participants drawn from a national pool with varied ages. This suggests that the effect of incentive framing on motivation is robust and generalizes to different populations.

Next we examined the moderating effect of age on the effect of incentive framing. Results revealed a main effect of incentive framing on persistence, as previously reported ($\beta = -62.08$; $SE = 21.0$; $p < .01$). Moreover, we observed a significant interaction between the incentive framing variable and age ($\beta = 1.73$; $SE = .71$; $p = .015$). A spotlight analysis (Hayes & Matthes, 2009) showed that among individuals whose age fell one standard deviation below the mean positively framed incentives were significantly less motivating than negatively framed incentives, $t(267) = 10.78$, $p < .01$. This pattern was directionally consistent until approximately the age of 36; however, after that point, the pattern is no longer present (see Figure 2). No main effect of age emerged in this analysis ($\beta = -.40$; $SE = .45$; $p > .37$). These findings suggest that positively framed incentives are generally less motivating than negatively framed incentives; however, this difference may be particularly pronounced among undergraduate students (Experiment 1) and other individuals in their 20s and early to mid-30s.

Because the negativity bias has been shown to diminish with age (e.g., Mather & Carstensen, 2005), the observed interaction between incentive framing and age on motivation provides evidence supporting our contention that positively framed incentives may be less effective than negatively framed incentives because of a negativity bias in information processing. Interestingly, we observe that motivation increases significantly with age under positively framed incentives ($\beta = 1.329$, $SD = .548$, $p = .016$), while motivation decreases directionally, but not significantly, with age

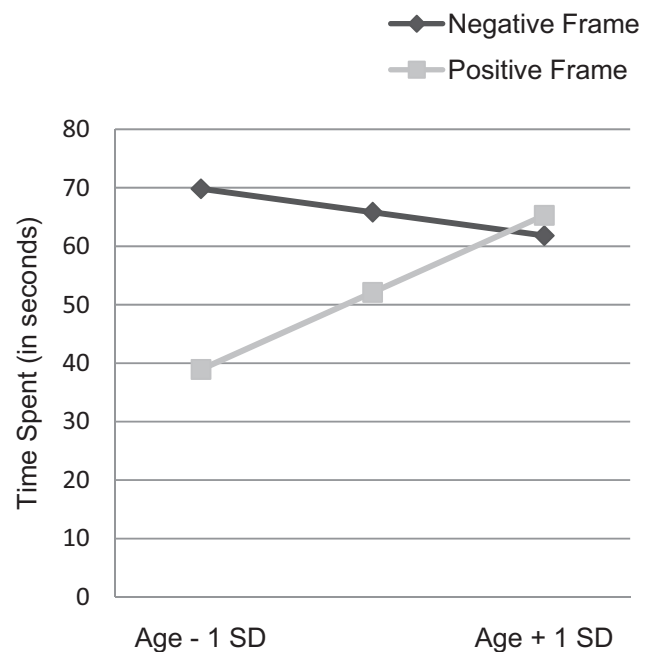


Figure 2. Experiment 2: Results—the effect of incentive framing on persistence (time spent) is moderated by the participants’ age.

under negatively framed incentives ($\beta = -.404$, $SD = .454$, $p = .375$). This suggests that, in the context of motivation, older individuals may attend more to positive stimuli than younger individuals; however, perhaps no less to negative stimuli. Future research could consider conducting a similar experiment exclusively on an elderly population to provide a more nuanced understanding of the implications for age and its relationship to the negativity bias on motivation.

Mediation by perceived unusualness. To address the alternate account that the observed effects occurred because the negatively framed incentive was simply more unusual, and not because of a negativity bias in information processing, the three measures of perceived atypicality of the incentive were averaged to create a composite measure of unusualness ($\alpha = .801$). An analysis of variance test revealed that participants in the negative frame condition rated their incentive as more unusual than those in the positive frame condition ($M_{Negative} = 5.57$, $SD = 1.10$, $M_{Positive} = 4.77$, $SD = 1.48$; $F(1, 262) = 25.27$, $p < .001$). To test whether this shift in perceptions of unusualness explained the effect of incentive framing on persistence, we used a mediation analysis using the bootstrapping technique suggested by Preacher and Hayes (2008). The results based on 5,000 bootstrapped samples indicated that the negatively framed incentive was rated as significantly more unusual than the positively framed incentive ($\beta = -.80$; $SE = .16$; $p < .001$); however, perceptions of unusualness had no effect on persistence ($\beta = 1.59$; $SE = 2.68$; $p > .5$). Because the 95% bias corrected confidence interval for the indirect effect includes 0 (lower 95% CI = -5.43 , upper 95% CI = 2.16), the mediation was not significant (Preacher & Hayes, 2008). Therefore, a shift in perceptions of unusualness cannot explain the effect of incentive framing on persistence.

Perceptions of fairness and enjoyment. To assess downstream consequences of implementing negatively framed incentives, the effect of the incentive framing manipulation on perceptions of fairness and task enjoyment was examined. No significant difference in perceived fairness emerged ($M_{Negative} = 5.18$, $SD = 1.62$; $M_{Positive} = 5.40$, $SD = 1.48$; $F(1, 262) = 1.211$, $p > .27$). Further, when asked to rate how much they enjoyed participating in the study, we again observe no effect of incentive framing ($M_{Negative} = 5.70$, $SD = 1.40$; $M_{Positive} = 5.83$, $SD = 1.37$; $F(1, 262) = .660$, $p > .4$). These findings offer preliminary evidence suggesting that a negatively framed incentive may not produce negative affective consequences, such as reduced task enjoyment, as compared with a positively framed incentive. Note that in both conditions perceptions of perceived fairness significantly exceed the midpoint (4—*neither agree nor disagree*; $M_{Negative} = 5.18$, $t(152) = 9.01$, $p < .001$; $M_{Positive} = 5.40$, $t(131) = 10.78$, $p < .001$), which suggests that the incentives' monetary value (\$0.02 per anagram) was well calibrated for this population.

Additional demographic measures. To test the robustness of the observed results, we conducted additional analyses to determine whether any of the other demographic variables collected moderated the observed pattern of results. We observed no evidence of moderation by gender ($F < 1$). Additionally, neither childhood-SES ($p > .6$) nor current-SES ($p > .8$) moderated the effect of incentive framing on motivation.

Having demonstrated that positively framed incentives are less motivating than negatively framed incentives using both a sample of undergraduates and a sample of working adults, one may ask

why such incentives are infrequently utilized. We argue that one reason for it may be that people hold the opposite intuition, and believe that a positively framed incentive will be more motivating than the negatively framed incentive. Experiment 3 explores this by testing people's predictions of which incentive frame they believe will be most motivating. To provide a strong test of our prediction, Experiment 3 uses a within-participants design, which allows participants to recognize that the monetary value of the incentive is identical in both conditions.

Experiment 3: Testing the Predicted Effects of Incentive Framing on Motivation

Method

The participants were 40 undergraduate students at a North American university. The survey was a one-page pencil and paper study and no demographic information was collected. Participants read instructions asking them to imagine two hypothetical scenarios corresponding to the two incentive structures used in Experiment 1. For the positive frame condition, participants were told to imagine that on one occasion they would be compensated with \$0.25 for each anagram that they solved and that if they correctly solved all six anagrams they would receive \$1.50. For the negative frame condition, participants were told that on another occasion they would be given \$1.50 before they began the anagram task and that they would lose \$0.25 for each anagram that they did not successfully complete. After reading the descriptions of these two incentive structures, participants were asked to indicate on which occasion they would "persist longer on the anagram task." The options provided were, "when I earn \$0.25 per completed anagram," "when I receive the total amount in the beginning and lose \$0.25 per uncompleted anagram," and "no difference."

Results

We argued that people would predict that they would be more motivated on a task where the incentive is framed positively as opposed to negatively. Consistent with this hypothesis, a significantly greater proportion of participants predicted that they would persist longer when the incentive was framed positively (74% vs. 26%; $\chi^2(1) = 8.53$, $p < .01$, see Figure 2; two participants predicting the incentive structure would not influence their motivation were not included in the analysis, cf. Novemsky & Dhar, 2005). Thus, we observe that participants' predictions of motivation were in direct contrast to the effect on actual motivation observed in Experiments 1 and 2.

Although this documents a novel demonstration of a reversal between actual motivation and predicted motivation, the experiments thus far do not address the potential psychological processes that might underlie this error in prediction. As stated previously, prediction biases often occur when people base predictions on their lay theories about behavior (Xu & Schwarz, 2009). We argue that one lay theory may be that enjoyment and task motivation are positively correlated, with the implication that the incentive structure that is more enjoyable to work under will be more motivating. The subsequent experiments will test for a lay belief in a positive correlation between the enjoyment of working toward an incentive and task motivation by testing people's beliefs about differences in

enjoyment under the two incentive structures (Experiment 4A), and people's beliefs about enjoyment and task motivation (Experiment 4B).

Experiment 4A: Intuitions About Incentive Framing and Enjoyment

Method

The participants were 47 undergraduate students at a North American university. The survey was a pencil and paper study and no demographic information was collected. The experimental design was similar to Experiment 3 and varied only in terms of the dependent measure. Instead of asking participants to indicate the incentive structure that they believed would be more motivating, participants were asked to indicate the incentive that would be more *enjoyable* to work toward. After reading descriptions of the two hypothetical occasions and the two different incentive structures, participants were asked to indicate the incentive structure they would find "more enjoyable" to work toward: "when I earn \$0.25 per completed task," "when I receive the total amount in the beginning and lose \$0.25 per uncompleted task," and "no difference."

Results

The results of Experiment 4A showed that a significantly greater proportion of participants predicted positively framed incentives would be more enjoyable to work toward than negatively framed incentives (95% vs. 5%; $\chi^2(1) = 31.41, p < .001$, see Figure 3; two participants predicting the incentive structure would not influence their motivation were not included in the analysis).

Experiments 3 and 4A have demonstrated that (a) people predict greater task motivation when working toward a positively framed

incentive than when working toward a negatively framed incentive, and (b) people predict greater enjoyment when working toward a positively framed incentive than when working toward a negatively framed incentive. However, it could be that these predictions resulted from using a within-participants design that draws attention to a difference in incentive structure. Said otherwise, a positively framed incentive may only seem more motivating and more enjoyable to work toward when it can be directly compared with a negatively framed incentive. To address this, Experiment 4B tests for predictions about enjoyment and task motivation for each incentive structure in a between-participants design. Further, this design allows us to test for the proposed correlation between enjoyment and task motivation.

Experiment 4B: Intuitions About Incentive Framing, Enjoyment, and Motivation

Method

The participants were 130 undergraduate students (50% male) at a North American university who were randomly assigned to one of two conditions (positive frame condition vs. negative frame condition). To test the robustness of the effect observed in Experiment 4A, the instructions were modified to describe a more ecologically valid task. Specifically, instructions told participants to imagine that their employer had given them a series of optional tasks that were not part of their regular work duties but provided them with a means to earn additional money. Participants assigned to the positive frame condition then read that they would be given \$25 as an incentive for every task that they successfully completed, for a maximum gain of \$200. Those assigned to the negative frame condition were told that they would be allocated \$200 at the outset, but that \$25 would have to be remitted for every uncompleted task. Participants were then asked to indicate how enjoyable it would be to work toward the incentive (scale: 1—*not at all enjoyable* to 9—*highly enjoyable*) and how motivated they would be to complete the set of tasks (scale: 1—*not at all* to 9—*very much*). The order in which these two questions were asked was counterbalanced and did not interact with the incentive framing manipulation on either measure.

Results

Consistent with the results of Experiment 3, participants assigned to the positive frame condition predicted that they would be more motivated than those assigned to the negative frame condition ($M_{Positive} = 7.36, SD = 1.34; M_{Negative} = 6.70, SD = 1.86; F(1, 129) = 4.96, p = .03, d = .41$). Participants assigned to the positive frame condition also predicted they would enjoy working toward the incentive more than those assigned to the negative frame condition ($M_{Positive} = 5.89, SD = 1.99; M_{Negative} = 5.23, SD = 1.32; F(1, 129) = 2.78, p < .1, d = .39$). Moreover, controlling for predicted enjoyment, the effect of the incentive framing on predicted motivation diminishes ($\beta = -.454, p = .1$), whereas the effect of enjoyment on predicted motivation remains significant ($\beta = -.310, p < .001$).

The correlation between predicted enjoyment and motivation was significant and positive among participants in both the positive frame ($r = .323, p < .05$) and the negative frame conditions

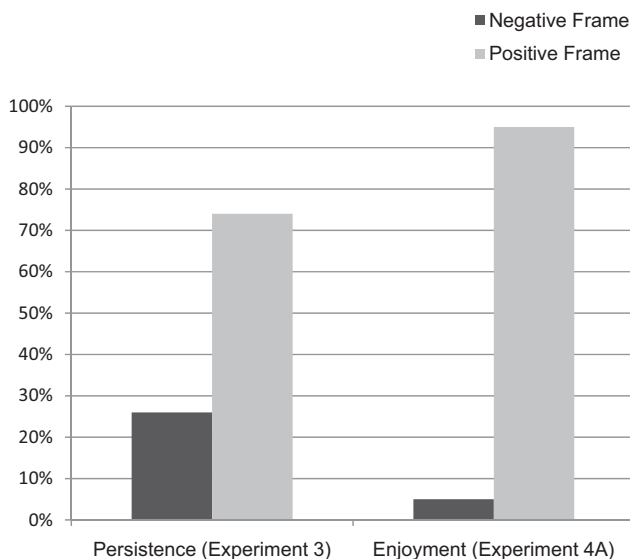


Figure 3. Experiment 3 and 4A: Results—the effect of incentive framing on predicted task persistence (Experiment 3) and predicted task enjoyment (Experiment 4A).

($r = .450, p < .01$; combined: $r = .425, p < .01$). This correlation indicates that people maintain a lay belief that the more enjoyable an incentive structure is to work toward, the more motivating that incentive will be. The size of the correlation did not differ across conditions.

Taken together, the experiments thus far demonstrated that positively framed incentives were less motivating than negatively framed incentives, although people incorrectly predicted that positively framed incentives would be more motivating. Further, we showed that people believe that positively framed incentives are more enjoyable to work toward, and that people have a lay theory that incentives that are more enjoyable to work toward are more motivating. Based on this, we argue that one reason why the observed reversal between predicted and actual motivation may have occurred is because when making predictions about motivation, people relied on this lay theory, which biased their predictions. However, it is important to note that there may be other factors that also influence predictions of motivation, which the existing data do not address. For example, participants may have indicated that they would be more motivated by a positively framed incentive in hopes they would be compensated with positively framed incentives, and not negatively framed incentives, in future experiments. At present, we believe the current set of experiments make a meaningful contribution to the existing literature by documenting that individuals can be prone to errors in prediction when predicting their future motivation, and highlighting one potential reason why such errors might occur. Future research may wish to explore the roles of other relevant variables in this process.

General Discussion

Throughout history individuals have been challenged by goals that demand effort and persistence. As a consequence, a great deal of academic research has been devoted to understanding the factors that promote motivation, engagement, and performance on challenging tasks. This work has identified a variety of motivational constructs, such as goals, values, self-efficacy, and control perceptions (e.g., Pintrich, Marx & Boyle, 1993), that affect performance by increasing intrinsic motivation. However, the implications for extrinsic motivators, such as incentives or rewards, have been shrouded in debate (see Deci, Koestern, & Ryan, 1999 and Eisenberger, Pierce, & Cameron, 1999). Although extrinsic incentives are used regularly in homes, schools, and workplace environments to promote certain behaviors, comparatively little academic inquiry has been devoted to exploring processes that underlie the effects of extrinsic incentives on motivation. Further, open questions remain as to whether people are prone to biases when predicting which rewards may be the most motivating.

The current research addressed these topics by exploring how the framing of an incentive affected both actual and predicted motivation. In doing so, the current set of experiments achieved several goals. First, we demonstrated that positively framed incentives are less motivating than negatively framed incentives, using both a sample of undergraduates (Experiment 1) as well as a sample of working adults (Experiment 2). Second, we highlighted certain populations among whom this effect is most pronounced by demonstrating the importance of age in determining the effectiveness of positively framed incentives (Experiment 2). This demon-

stration suggests that although negatively framed incentives may be more effective than positively framed incentives when applied among younger populations (e.g., undergraduate settings), firms may wish to consider the age of their employees before employing them across the organization. In so doing, we addressed questions raised by prior work (Hossain & List, 2012) on the role of age in the effectiveness of negatively framed rewards. Further, the results of Experiment 2 support our contention that it is a negativity bias in information processing (Baumeister et al., 2001), and not other factors (e.g., the atypicality of the incentive), that contributes to the effectiveness of negatively framed incentives on motivation.

Finally, we test how the observed effects of incentive framing on motivation compared with people's intuitive predictions about which incentive structure would be most motivating. In a series of experiments, we observe that people are systematically biased when predicting future motivation. Specifically, individuals incorrectly predicted that positively framed incentives would be more motivating than negatively framed incentives (Experiment 3), which may be because of their reliance on a lay theory that incentives that are more enjoyable to work under are more motivating (Experiments 4A and 4B). In doing so, we highlighted one reason why such incentives may be used infrequently, despite their efficacy. Further, we contributed to the diverse literature on hedonic mis-prediction (e.g., Brickman, Coates, & Janoff-Bulman, 1978; Gilbert et al., 2004; Loewenstein, 2000; Wang, Novemsky, & Dhar, 2009) by revealing that predictions of future motivation may be prone to similar biases as predictions of future preferences (e.g., Xu & Schwarz, 2009).

Although this work succeeds in demonstrating that incentive framing has a robust effect on task motivation using different populations of participants (undergraduates and working adults), the limitations of the current work suggest fruitful areas for future inquiry. For example, in the current work, the effect of incentive framing on motivation was tested in the context of a single task. As a result, the current research cannot speak to the long-term consequences of implementing negatively versus positively framed incentives. Experiment 2 revealed that being assigned to receive a negatively framed incentive did not negatively affect perceptions of fairness or task enjoyment, as compared with being assigned to receive a positively framed incentive; however, it is possible that if a negatively framed incentive was implemented over a longer time horizon (e.g., several weeks) or using a more consequential amount of money (e.g., a large percentage of one's salary) other factors, such as stress or negative affect, could interact with the manipulation to determine performance. Future research might test for the effect of incentive framing while manipulating additional situational variables, such as time horizon or incentive amount, to explore important boundary conditions to the observed effects.

Further, this research documented a novel incidence of when predictions of motivation and actual motivation diverge, and suggests that the observed error in prediction is attributable to a reliance on lay theories about behavior. The lay theory discussed here was the theory that motivation and enjoyment are positively correlated. Although this theory has been widely documented in the organizational literature (Fisher, 20037), it is important to mention that people may rely on different lay theories about motivation in different contexts. For example, when predicting whether soldiers will perform well in battle, certain individuals may have lay theories that other factors, such as fear or anger and

not enjoyment, will increase motivation. Future researchers may wish to explore the factors that affect which lay theories of motivation individuals use when predicting motivation in different contexts to form a more general framework of when people will be prone to mis-predicting motivation.

Finally, this research demonstrates that individuals are prone to biases when predicting which incentives will be more motivating, and suggests that people may select suboptimal incentive frames for motivation as a consequence; however, incentives are not the only motivational tool that individuals regularly select. For example, educators can assign different types of goals to students (e.g., performance vs. mastery goals; Dweck, 1999), students can select their own metacognitive strategies for self-regulated learning (e.g., memorization vs. organization; Pintrich & De Groot, 1990; Zimmerman, 1989; Zimmerman, 1990), and policymakers can use different motivational strategies in their communications (e.g., highlighting academic possible selves vs. feared off-track possible selves; Oyserman, Bybee, & Terry, 2006). Just as the current research directly tested for a divergence between actual and predicted motivation as a consequence of incentive framing, future research may wish to explore whether individuals are similarly prone to biases when predicting which goals and strategies will be most motivational. Such explorations might help highlight and address the limitations of “cold,” or overly rational, models of conceptual change in predicting classroom behavior, as discussed in prior work (e.g., Pintrich, Marx, & Boyle, 1993).

Implications for Educators and Managers

A major objective for educators as well as employers is determining how to motivate performance while keeping incentive costs minimal. Although the performance goal may be fixed (e.g., a standardized test score or a sales goal) and the monetary value of an incentive may be bounded (e.g., constrained by budgets), many individuals are free to structure their incentives themselves (Heath, 1999) and thus may have flexibility in terms of how to frame the incentive.

Experiments 1 and 2 demonstrated that individuals seeking to motivate others on one time tasks could consider using a negatively framed incentive, as opposed to using the more traditional pay-for-performance structure. To do so would require endowing their participants with an incentive then framing their accomplishments as the means by which they can retain that endowment. For instance, to motivate students to complete a set of optional extra assignments during the week, an educator might give all students a fixed amount of extra points toward their grade. Students could then be told that by completing all of the assignments, they could retain the points. However, points would be deducted to the extent that the assignments were not completed. Certain law firms currently take advantage of this logic by framing employees’ annual bonuses as part of their starting salary (e.g., a \$150,000 annual salary plus a \$50,000 bonus) then informing employees that if they do not meet the requisite number of billable hours, they will lose this previously allocated annual bonus. Further, businesses are increasingly experimenting with the use of negatively framed incentives to motivate health-related behaviors. For example, a recent survey of 800 mid- to large-size firms revealed that six in 10 employers plan to impose financial penalties on employees who fail to take actions to improve their health (Kwoh, 2013).

However, it is important to reiterate that although the data suggest that framing an incentive negatively as opposed to positively may be a way to increase motivation without increasing costs, these results should be interpreted cautiously. As mentioned previously, the current research tested the effect of incentive framing on motivation only in the context of a single set of tasks, using small sums of money. It is possible that if a manager were to implement negatively framed incentives over a longer time horizon or using more consequential sums additional factors not accounted for in the current set of experiments could moderate the observed pattern of results. Additionally, although we illustrate one individual difference that tempers the effectiveness of positively framed incentives (age), there may be other factors that could affect the effectiveness of such rewards that have yet to be explored (e.g., corporate culture). In summary, although we believe the current results suggest that incentive framing may have important, counterintuitive applications for motivation, we also believe it should be applied with careful consideration to the scope and context.

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