

The Experience Matters More Than You Think: People Value Intrinsic Incentives More Inside Than Outside an Activity

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We document a shift in the value assigned to intrinsic incentives: people value these incentives more inside an activity than outside the activity (i.e., during vs. before or after pursuit). For example, people care more about the level of interest of their present work task than of past or future work tasks. We document this shift across a variety of activities (exercising, visiting a museum, and lab tasks) and using various measures, including rated importance of intrinsic incentives inside and outside pursuit, actual and planned persistence on activities that offer these incentives, and regret when choosers outside pursuit forgo intrinsic incentives that pursuers later seek. This shift in valuation occurs because intrinsic incentives improve the experience during action pursuit, and therefore, this shift is unique to intrinsic incentives. Extrinsic incentives, by contrast, are valued similarly inside and outside pursuit.

Keywords: motivation, intrinsic/extrinsic incentives, self-regulation, evaluation, regret

People often rely on their present evaluation of their future actions when making decisions that influence these actions. For example, people select a workout regimen or a work task based on what they value about these future activities at the moment of choice. What people value when choosing might be different from what they value later on when pursuing these actions, and if what people care about changes, they may choose activities that they fail to follow through on or that they regret pursuing.

We explore the value people assign to intrinsic incentives before, after, and while pursuing their actions. Whereas incentive theory traditionally explores extrinsic incentives, which are the positive outcomes outside the activity that result from pursuing it (i.e., rewards), research suggests other “intrinsic” incentives exist, which are internal to the activity and cannot be separated from it (e.g., the positive experience delivered as part of pursuing an activity; Fishbach & Choi, 2012; Heath, 1999; Higgins & Trope, 1990; Ryan & Deci, 2000; Sansone & Harackiewicz, 1996). For example, workouts not only improve people’s health (extrinsic incentives); they also can be relaxing and energizing (intrinsic incentives). Similarly, work tasks not only offer compensation (extrinsic incentives); they can also be challenging or interesting (intrinsic incentives).

The value of intrinsic incentives may depend on whether the evaluator is currently engaging in an activity or whether he or she is outside pursuit (i.e., before or after the activity). Specifically, our research explores whether people value intrinsic incentives

more inside pursuit of an activity than outside pursuit. We predict a shift in the evaluation of intrinsic incentives, because outside pursuit, people are in a cold state and do not experience intrinsic incentives to the same extent as when they are inside pursuit (Loewenstein & Schkade, 1999; Metcalfe & Mischel, 1999; Van Boven & Loewenstein, 2003; Van Boven, Loewenstein, Welch, & Dunning, 2012), and therefore, feel intrinsic incentives are less important. We compare the shift in valuing intrinsic incentives to that of extrinsic incentives, and predict that people will value the latter similarly during pursuit as outside pursuit.

We first document this shift in importance of intrinsic incentives for people’s explicit evaluation (how important these incentives are for them inside and outside pursuit). We then build on these findings to show how this difference in importance influences behavior (how much intrinsic incentives influence planned vs. actual persistence) and the experience of regret (how much people regret choosing to forgo intrinsic incentives when they are actually pursuing a task).

Intrinsic Incentives

The activities people contemplate pursuing vary in the degree to which they offer intrinsic incentives, which come from the experience of pursuing the activity and that differ from extrinsic incentives, which are separable outcomes of the activity (Fishbach & Choi, 2012; Kruglanski, 1975; Mischel, Shoda, & Rodriguez, 1989; Ryan & Deci, 2000; Wrzesniewski et al., 2014). At times, intrinsic and extrinsic incentives are negatively associated. For example, indulging in fatty food offers intrinsic taste benefits at extrinsic health costs, and completing a painful medical checkup offers extrinsic benefits at intrinsic costs. At other times, both types of incentives coexist, for example, when selecting an exercise activity that relieves stress (intrinsic) and improves health outcomes (extrinsic) or when choosing a job that is challenging (intrinsic) and pays well (extrinsic). Indeed, envisioning a long-term engagement in any activity that completely lacks one type of incentive, either intrinsic or extrinsic, is hard.

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Previous motivation theory and research addressed these two types of incentives. Thus, research distinguished between endogenously attributed actions, in which the action forms an end in and of itself, and exogenous actions, in which the action serves as a means to a further end (Kruglanski, 1975). Similarly, research on process versus outcome motivation showed activities can be performed for their own sake or as a means to reach an outcome or end state (Harackiewicz & Sansone, 1991; Sansone & Harackiewicz, 1996; Sansone & Smith, 2000). These two types of incentives are also grounded in research differentiating consummatory behaviors, engaged in for their own sake, from instrumental behaviors, in which a person aims to accomplish a goal independent of the specific activity (Millar & Tesser, 1992). Although differing in many respects, these frameworks share the assumption that incentives for pursuing an activity can be part of the activity or can be external to it, arriving as a result of pursuit.

The rich line of research on intrinsic versus extrinsic motivation identified that extrinsic incentives can further undermine intrinsic incentives for pursuing an activity, because once an activity is associated with an extrinsic incentive, the association between the activity and its intrinsic incentives weakens (Higgins & Trope, 1990; Lepper, Greene, & Nisbett, 1973; Maimaran & Fishbach, 2014; Shah & Kruglanski, 2002). Moving beyond positive experience, research on self-determination theory further reveals that intrinsic activities often satisfy three basic psychological needs—competence, relatedness, and autonomy—and the presence of extrinsic incentives directly undermines intrinsic motivation by thwarting the fulfillment of these needs (Deci & Ryan, 2008).

Valuing Intrinsic Incentives Inside Versus Outside Pursuit

In exploring the valuation of intrinsic incentives, we distinguish between two distinct motivational states: inside pursuit and outside pursuit. Inside pursuit of an activity, people are engaging in an existing task, action, or goal, whereas outside pursuit, people are considering an activity or a set of activities they are not currently pursuing. Thus, being outside pursuit includes deciding between potential tasks or actions, setting goal targets, and anticipating eventual pursuit, as well as reflecting on past tasks and actions when no planning or anticipation is involved. This distinction is similar to that between planner and actor (Gollwitzer, 1990; Kruglanski et al., 2000; Kuhl & Beckmann, 1985); however, by “outside pursuit,” we also refer to people’s evaluations after pursuing an action.

At times, being inside or outside pursuit is separated by months or even years, such as in evaluating a current trip compared with a future trip. Other times, these motivational states are only separated by a few minutes, as in evaluating an upcoming work task. We explore the possibility that, regardless of the temporal distance, a fundamental difference between being inside versus outside pursuit refers to the value placed on intrinsic incentives. Specifically, we predict that people value these incentives more inside than outside pursuit of the activity.

Our prediction is based on research on self-control, which explores the lure of immediate rewards (Mischel et al., 1989). Self-control theory predicts that rewards are most attractive when they are available (inside pursuit) than from a distance (outside pursuit). Accordingly, self-control research has documented that

the lure of low-order temptations temporarily increases as the opportunity to act on these temptations approaches (Ainslie, 2001; Rachlin, 2000). People who, from a distance, mainly value the larger reward (e.g., getting in shape) may switch to valuing a smaller reward (having an enjoyable workout), when the smaller reward is immediately available (i.e., smaller-sooner vs. larger-later). A similar analysis was applied to goal conflicts (e.g., between studying and partying; Fishbach & Converse, 2010). For example, the option of studying can overall dominate activity choice, but on the night of the party, for a short and critical period, the option to party is significantly more attractive, potentially even more so than the option to study, because unlike studying, the reward is immediately available.

Following from this, because intrinsic incentives come from pursuing (rather than completing) the activity, it is likely that the attraction of intrinsic incentives—such as short-term temptation—picks up inside pursuit of the activity. Thus, although intrinsic incentives can be delayed (e.g., exercising now will cause relaxation later), these incentives are often either immediate or are associated with an immediate delivery (i.e., part of pursuit), and thus, intrinsic incentives could become more important inside pursuit.

Our prediction further follows from research on the empathy gap, which suggests people underestimate the strength of emotional experience and the influence of emotions and other visceral drives (e.g., hunger, fatigue) in making predictions for their own and others’ behavior (Loewenstein, 2000; Van Boven, Loewenstein, Welch, & Dunning, 2012). Only when people are in a “hot state” (visceral drive, emotional experience) do they appreciate the strength and influence of that state. For example, research finds that only adults who are actively experiencing social pain fully appreciate the pain of emotional bullying for middle schoolchildren (Nordgren, Banas, & MacDonald, 2011), and that only tired people fully appreciate the impact of fatigue on behavior (Nordgren, van der Pligt, & van Harreveld, 2006). This literature further assumes people underestimate the strength of their own personal experience when they are in a cold state, for example, the strength of the positive experience that keeping busy engenders (that, notably, is distinct from failing to recognize that keeping busy engenders positive feelings in the first place; Comerford & Ubel, 2013; Hsee, Yang, & Wang, 2010). Because intrinsic incentives tend to be experiential, a potential consequence of undervaluing the strength of experience when in a cold state is that people may value intrinsic incentives more when engaging in the activity than before in planning their action, or later after pursuing it.

Based on the aforementioned analysis, our key moderator is the type of incentive: intrinsic versus extrinsic. We predict that the shift in incentive importance when inside or outside pursuit is unique to intrinsic incentives, because only these incentives are closely associated with pursuing the activity and thus with an immediate delivery. A related question refers to how the importance of extrinsic incentives might vary between the two states. On the one hand, we could expect that any incentive would appear more important inside than outside pursuit, because inside pursuit people wish to maintain their engagement motivation through more positive evaluations (Fishbach, Shah, & Kruglanski, 2004; Kuhl & Beckmann, 1985). On the other hand, unlike intrinsic incentives, extrinsic incentives are associated with the outcome of the activity. The importance of these extrinsic incentives is there-

fore less likely to pick up inside pursuit, and we expect them to be valued similarly inside and outside pursuit.

Notably, a third possibility exists, in which extrinsic incentives are seen as *less* valuable inside than outside pursuit. Indeed, Heath (1999) documented an extrinsic incentives bias whereby people believe others are more motivated by extrinsic rewards (and less motivated by intrinsic ones) than they themselves are. If people view themselves outside pursuit similarly to how they view others (Pronin & Ross, 2006), they could value extrinsic incentives more outside an activity than inside pursuit. Against this alternative, we argue that the self-other discrepancy is caused by differences in access between self and other knowledge. However, people have similar access to their own motivations inside and outside pursuit. Therefore, using our paradigm, those inside pursuit are less likely to value any incentive less than those outside pursuit, because the former are, by definition, more involved with the action. The one instance when extrinsic incentives should appear less valuable inside pursuit than outside is when an intrinsic-extrinsic tradeoff exists, for example, when people assign decision weight to these incentives such that, by definition, more weight on intrinsic incentives implies less weight on extrinsic incentives.

Overall, we predict that when inside a task and pursuing an activity, people place more importance on intrinsic incentives than when they are outside pursuit. As a result, people do not accurately predict the influence of intrinsic incentives on task persistence in advance. For example, when choosing an activity such as which exercise class to take, how boring or engaging the class is may be less important to individuals outside pursuit. However, once they have started the workout, the experience of boredom versus interest becomes important and will determine whether they are able to persist in their workout, as well as whether they come to regret their choice.

Present Research

In the current work, we use different approaches to demonstrate a shift in evaluating intrinsic incentives. First, we measure how people value these incentives when they are inside and outside pursuit. Second, we measure task persistence, and hypothesize that a minimal increase in intrinsic incentives increases persistence, though predictors (outside pursuit) fail to realize the impact of such an increase. Third, we measure choice regret for those deciding between tasks that trade off intrinsic and extrinsic incentives. In a choice dilemma in which choosers outside pursuit decide to forgo intrinsic incentives (to receive extrinsic incentives), we predict pursuers will regret making the choice to forgo intrinsic incentives.

Our main moderator is the type of incentive. Because any incentive might matter more inside than outside a task, we compare the valuation of intrinsic incentives to that of extrinsic incentives, which we expect are valued similarly inside and outside pursuit. We first test our hypothesis by assessing the importance gym-goers place on intrinsic (vs. extrinsic) incentives for their current (inside) versus future (outside) exercise (Study 1). We follow this by examining the value museum guests place on intrinsic (vs. extrinsic) incentives for their current (inside), future (before/outside), or previous (after/outside) museum visit (Study 2). In Study 2, we also manipulate the timing of the incentives (immediate vs. delayed), predicting intrinsic incentives will appear

more valuable for present actions even if they are delivered after a delay. That is, the association between intrinsic incentives and immediate delivery, rather than the actual immediacy, explains the shift in valuation. Next, we study the value people place on these incentives inside and outside an experimental task (Study 3).

After documenting the basic effect that intrinsic incentives are valued more inside than outside pursuit, we move to the behavioral markers of this shift in incentive importance. We predict that minimal differences in intrinsic incentives influence pursuers' task persistence (inside) but do not influence predicted persistence (outside; Study 4) and that the strength of the positive experience that comes from intrinsic benefits mediates this effect on persistence (Study 5).

Finally, we predict that when facing a choice between activities that require trading off incentives, people regret choosing to forgo intrinsic incentives, which they weigh more heavily inside than outside pursuit (Study 6). Such a pattern would suggest choosers who forgo intrinsic interest may be choosing suboptimally in that they come to regret their task choice and realize the forgone alternative would have provided a better outcome (Bell, 1982; Gilovich & Medvec, 1995; Loomes & Sugden, 1982).

Study 1: Importance of Intrinsic Incentives in Exercising

Exercising involves both intrinsic incentives (e.g., having a fun and enjoyable workout) and extrinsic ones (e.g., staying in shape or becoming healthier). We tested our hypothesis that intrinsic incentives matter more inside than outside pursuit of an activity by surveying gym-goers on the importance of incentives either in deciding how long to currently work out (inside pursuit) or in deciding how long to work out in the future (outside pursuit). Specifically, we surveyed gym-goers at a gym about their present workout (inside-pursuit condition) and, 1 week later, about their next workout (outside-pursuit condition). We predicted intrinsic incentives would be more important inside than outside pursuit, but the importance of extrinsic incentives would be similar for these motivational states.

Method

Participants. We predetermined a sample size of 40¹ for this fully within-subjects design. We planned to collect data from 80 participants, expecting half to complete the second survey (this attrition rate is common for studies that involve a follow-up task). We approached 82 undergraduate students and university staff at a campus gym and asked them to complete a two-part study. Participants completed the first part of the study at the gym in return for a granola bar. Participants received an email 1 week later to complete the second part of the study and were paid \$2.00. Only participants who completed both parts of the study were included in the final analysis ($n = 54$). Before running any analyses, we

¹ Sample size in Study 1 and later studies was determined based on studies on research manipulating motivational state (e.g., Fishbach & Choi, 2012). We ran 40 participants per condition in Studies 1–2, 50 per condition in Studies 3–5, and 30 per condition in Study 6. We report all data exclusions, all conditions, and all measures in the studies.

decided to include all participants (25 females; $M_{\text{age}} = 26.24$, $SD = 12.22$).²

Procedure. The study used a 2 (motivational state: outside vs. inside pursuit) \times 2 (incentives: intrinsic vs. extrinsic) within-subjects design. A research assistant invited gym-goers to participate in the first session of the study either right before a workout or when switching between workouts. Participants answered, “How important is each factor to you in deciding how much to exercise right now?” (inside-pursuit condition). This same group of participants received an email 1 week later with a link to a survey asking them “How important is each factor to you in deciding how much to exercise later this week?” (outside-pursuit condition).

For both surveys, participants rated the following factors on a 7-point scale (0 = *not important*, 6 = *very important*). We assessed value assigned to intrinsic incentives ($\alpha = .88$): (a) “How important is it that the workout is enjoyable?” (b) “How important is it that the workout feels fun?” (c) “How important is it that the workout feels relaxing and stress-relieving?” and (d) “How important is it that the workout feels energizing?” We further assessed value assigned to extrinsic incentives ($\alpha = .79$): (a) “How important is it that you keep in shape as a result of exercising?” (b) “How important is it that you improve your health as a result of exercising?” (c) “How important is it that you become stronger as a result of exercising?” and (d) “How important is it that working out will give you energy later in the day to carry out tasks?” We presented the questions in blocks of intrinsic and extrinsic incentives and counterbalanced block order.

Results and Discussion

We collapsed the items measuring the value assigned to each type of incentives in the present and future conditions, separately. A repeated measures analysis of variance (ANOVA) of motivational state (inside vs. outside pursuit) by incentive importance (intrinsic vs. extrinsic) yielded a main effect of incentive, $F(1, 50) = 20.63$, $p < .001$, $\eta_p^2 = .29$. Overall, participants rated extrinsic incentives as more important for working out ($M = 4.76$, $SD = .82$) than intrinsic incentives ($M = 4.22$, $SD = .92$). More important, the ANOVA yielded the predicted Incentives \times Motivational state interaction, $F(1, 50) = 4.22$, $p = .045$, $\eta_p^2 = .08$ (see Figure 1). In support of the hypothesis, participants rated intrinsic incentives as more important inside pursuit ($M = 4.37$, $SD = .90$) than outside pursuit ($M = 4.08$, $SD = 1.13$), $t(53) = 2.47$, $p = .017$, $d = .34$. By contrast, participants valued extrinsic incentives as similarly important inside and outside pursuit ($M_{\text{inside}} = 4.80$, $SD = .85$; $M_{\text{outside}} = 4.71$, $SD = 1.05$), $t < 1$. No interactions occurred involving block order ($ps > .36$).

These results suggest gym-goers value intrinsic incentives more inside a workout than when they are outside the activity. For example, having an enjoyable workout is important when deciding how much to exercise in the moment, but people do not value having an enjoyable workout nearly as much when deciding how long to persist exercising in the near future. We argue this shift in importance is unique to intrinsic incentives. Indeed, people do not care about all incentives more when they are pursuing the activity: extrinsic incentives are similarly important inside pursuit of a workout as they are outside pursuit.

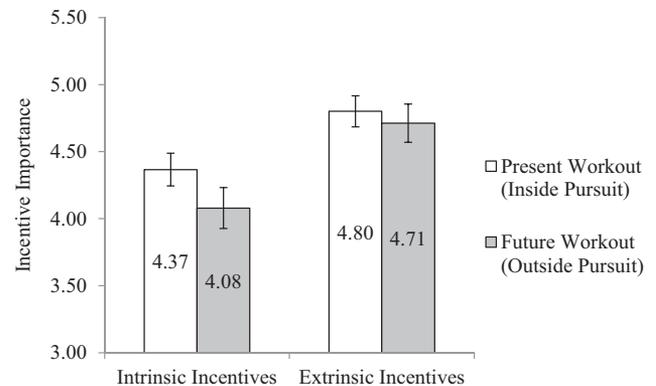


Figure 1. In Study 1, intrinsic incentives are rated as more important inside pursuit of a present workout than outside pursuit of a future workout, whereas extrinsic incentives do not differ in importance between motivational states (lines in bars represent $\pm 1 SE$).

Posttest 1: Construal of intrinsic and extrinsic incentives.

We suggest intrinsic incentives matter more inside pursuit because they are associated with an immediate delivery. Alternatively, intrinsic incentives are concrete and are, therefore, attractive during pursuit, when people are in a lower level construal. Specifically, construal level theory proposes that at a distance, events are represented by their abstract, global features, whereas closer up, they are represented by their concrete local features (Trope & Liberman, 2003). If intrinsic incentives are concrete (more so than extrinsic ones), they could be attractive inside pursuit, when people are in a low-level construal. We tested this account in two ways.

First, we tested the abstract representation of the intrinsic and extrinsic incentives using a coding scheme based on the linguistic category model (LCM; Semin & Fiedler, 1988). Previous research has used the LCM to assess the abstractness of actions, with higher level construals representing behavior in general, abstract terms rather than in more concrete terms (Fujita, Henderson, Eng, Trope, & Liberman, 2006; Trope & Liberman, 2003; Trope & Liberman, 2010). Twenty-nine undergraduate and graduate students (18 female; $M_{\text{age}} = 21.86$, $SD = 4.49$; in a lab experiment) coded the eight incentives from Study 1 into three categories after reading definitions for each: “Descriptive Action Verbs (DAVs) describe a specific behavior from beginning to end and involve a physical feature (e.g., to kick, to visit, to walk);” “Interpretive Action Verbs (IAVs) describe a behavior with a beginning and end, but do not involve a physical component (e.g., to help, to encourage, to mislead) and can contain an evaluative aspect (e.g., to help = positive; to mislead = negative);” and “State Verbs (SVs) describe invisible mental or emotional states (e.g., to love, to hate, to trust) and do not have a clearly defined beginning and end.” Semin and Fiedler (1988) demonstrated these categories are organized along

² There were no differences between those who completed both surveys (and were included in the final sample) and those who completed only the first survey in the valuation of intrinsic incentives, $t(80) = 1.13$, $p = .26$, and extrinsic incentives, $t(80) = 1.19$, $p = .24$. This result suggests our final sample (who completed both surveys) is similar to and representative of our original sample.

a dimension of concreteness to abstractness, with DAVs being the most concrete and SVs being the most abstract. Participants received instructions to place each incentive (intrinsic: to enjoy, to relax, to feel energized, to have fun; extrinsic: to become stronger, to keep in shape, to improve health, to receive energy) into one of the three categories. To reflect the different levels of abstraction, we used a weighting scheme based on 1, 2, and 3 to weight DAVs, IAVs, and SVs, respectively, and averaged the ranking for intrinsic and extrinsic incentives (Fujita et al., 2006; Semin & Smith, 1999). The resulting abstractness index score is an ordinal scale that reflects a degree of abstraction between 1 (concrete) and 3 (abstract). A Wilcoxon signed-ranks test found participants viewed intrinsic incentives as significantly more abstract ($M = 2.32$, $SD = .31$) compared with extrinsic incentives ($M = 1.65$, $SD = .39$), $Z = 4.32$, $p < .001$, $r = .57$. This finding goes against the assumption that intrinsic incentives are concrete.

In a second part, we used another measure of abstraction taken from Bar-Anan, Liberman, and Trope (2006). Forty undergraduate and graduate students (21 female; $M_{\text{age}} = 20.98$, $SD = 2.39$; approached on campus) rated the abstractness of intrinsic and extrinsic incentives from Study 1 ($-7 = \text{abstract}$, $7 = \text{concrete}$). Consistent with the posttest above, participants rated intrinsic incentives as more abstract ($M = .34$, $SD = 3.02$) than extrinsic ones ($M = 2.23$, $SD = 2.16$), $t(39) = 3.88$, $p < .001$, $d = .61$. This finding suggests people's low-level construal during pursuit of an action cannot account for the greater value assigned to intrinsic incentives, because these incentives are rated as abstract (more so than extrinsic incentives).

Posttest 2: Timing of intrinsic and extrinsic incentives. We assume that intrinsic incentives are associated with immediate delivery; therefore, they are more valuable in the midst of pursuing the action than outside pursuit. To test this assumption, we predetermined a sample size of 50, and opened up the study for 50 HITs on Amazon's Mechanical Turk (Mturk). Mturk returned 51 (20 female) respondents ($M_{\text{age}} = 31.78$, $SD = 9.58$). Participants rated four common intrinsic workplace incentives (learning new things, developing skills and abilities, accomplishing something worthwhile, and doing something that makes you feel good about yourself) and four common extrinsic workplace incentives (receiving a paycheck, fringe benefits, having job security, and receiving praise from a supervisor; all incentives were adopted from Heath, 1999) on when they believed each benefit would be delivered (0 = *immediately while working*, 6 = *at a delay after completing some work*). Participants then rated the four intrinsic and four extrinsic incentives used in Study 1 (e.g., exercising to relax vs. to keep in shape) on when they believed each benefit would be delivered (0 = *immediately while exercising*, 6 = *at a delay after exercising*). The presentation order of intrinsic and extrinsic incentives was counterbalanced, with no effect of order, $F_s < 1$.

Pairwise analyses revealed intrinsic-work incentives ($M = 3.69$, $SD = 1.06$) were rated as arriving more immediately than extrinsic-work incentives ($M = 4.30$, $SD = 1.27$), $t(50) = 3.15$, $p = .003$, $d = .44$. Analyzing our results for exercise incentives, we find participants rated intrinsic-exercise incentives as arriving more immediately ($M = 2.83$, $SD = 1.23$) than extrinsic-exercise incentives ($M = 5.25$, $SD = 1.19$), $t(50) = 9.22$, $p < .001$, $d = 1.29$. It appears that intrinsic incentives—both used by previous research and in our study—are expected to arrive soon, and sooner than extrinsic incentives.

Confirming our hypothesis that intrinsic incentives matter more inside pursuit and are further associated with immediate delivery, a follow-up question is whether people also value intrinsic incentives that are *delayed* (vs. immediate) more inside than outside pursuit. Theoretically, a preference for immediate incentives (Ainslie, 2001; Baumeister & Heatherton, 1996; Mischel et al., 1989; Rachlin, 2000) is distinguished from a preference for intrinsic incentives. And people should value intrinsic incentives more inside pursuit not because they are actually immediate, but because they are associated with immediacy. Hence, in our next study, we test whether the shift toward evaluating intrinsic incentives more inside pursuit generalizes to evaluations of such incentives after a delay.

Study 2: Importance of Intrinsic Incentives in a Museum Visit

In this study, we experimentally separated the type of incentive (intrinsic vs. extrinsic) from the time of delivery (immediate vs. delayed) in the context of visiting a science and industry museum. Visiting a museum offers intrinsic incentives (e.g., broadened horizons) and extrinsic incentives (e.g., impressing others). These incentives can further be delivered immediately (e.g., while exploring the museum) or after a delay (e.g., during the following weeks after the visit). We predicted that museum guests value intrinsic (but not extrinsic) incentives more during their visit than before or after, and that this effect should be independent of the timing of the incentives (immediate vs. delayed delivery).

To compare an inside perspective with an outside perspective, both before and after pursuit, Study 2 added a condition of evaluating incentives after activity completion, that is, outside the activity, but without planning. By including an after-activity condition, we test whether the change in valuation of intrinsic incentives observed in Study 1 is driven by a greater emphasis during pursuit or, alternatively, by a lower emphasis in planning before pursuit of a future activity.

Method

Participations. We predetermined a sample size of 240 (40 per cell), and collected responses from 249 (142 female) visitors to a large science and industry museum. The participants completed the study in an area dedicated to learning about and participating in behavioral research, in exchange for candy ($M_{\text{age}} = 43.03$, $SD = 16.29$). First-time guests who had never been to a science museum before were not eligible to participate.

Procedure. The study used a 3 (motivational state: outside/past vs. inside/present vs. outside/future pursuit; between-subjects) \times 2 (timing: immediate vs. delayed; between-subjects) \times 2 (incentives: intrinsic vs. extrinsic; within-subjects) mixed-model design. Depending on the experimental condition, participants rated the importance of these incentives for their previous science museum visit, present visit, or future visit.

Specifically, in the previous-visit condition, participants wrote the date of their last visit to a science museum, what science museum they had visited, and were asked, "When you last visited a science museum, how important were the following to you?" In the current-visit condition, participants were asked, "As you visit this science museum, how important are the following to you?" In

the future-visit condition, they wrote the date they believed their next visit to a science museum would be, what museum they would be visiting, and were asked, “When you next visit a science museum, how important will the following be to you?” Participants then saw a list of six factors and rated them on a 7-point scale (0 = *not important*, 6 = *very important*).

Factors mapped onto immediate (*delayed*) intrinsic incentives ($\alpha = .80$): (a) “Feeling excited while exploring the museum” (“*Feeling excited about my museum visit during the following weeks*”), (b) “Feeling interested while exploring the museum” (“*Feeling interested in what I’ve seen at the museum during the following weeks*”), and (c) “Feeling my horizons broadened while exploring the museum” (“*Feeling my horizons broadened during the following weeks*”).

Factors mapped on to immediate (*delayed*) extrinsic incentives ($\alpha = .75$): (a) “Impressing my family and/or friends by expressing knowledge while exploring the museum” (“*Impressing my family and/or friends by expressing knowledge from my museum visit during the following weeks*”), (b) “Getting conversation topics (something to talk about), which I could discuss with my family and/or friends while exploring the museum” (“*Getting conversation topics (something to talk about) from my museum visit during the following weeks*”), and (c) “Checking something off of my ‘cultural to-do list’ while exploring the museum” (“*Checking something off of my ‘cultural to-do list’ during the following weeks*”).

Results and Discussion

We collapsed the items measuring intrinsic and extrinsic incentives. A repeated measures ANOVA of motivational state (past vs. present vs. future pursuit) and timing (immediate vs. delayed) on incentive importance (intrinsic vs. extrinsic) revealed a main effect of incentive, $F(1, 243) = 236.80, p < .001, \eta_p^2 = .49$, where intrinsic incentives were rated as more important than extrinsic ones ($M_{\text{intrinsic}} = 4.67, SD = 1.04; M_{\text{extrinsic}} = 3.36, SD = 1.41$). More important, we find the predicted interaction between motivational state and incentives, $F(2, 243) = 3.36, p = .037, \eta_p^2 = .03$, and, as predicted, the three-way interaction between motivational state, incentives, and timing (immediate vs. delayed) was not significant, $F(2, 243) = 1.61, p = .20$ (see Figure 2).

Simple contrast analysis revealed an effect of motivational state on intrinsic incentives, $F(2, 246) = 4.39, p = .013, \eta_p^2 = .03$. Intrinsic incentives were more important inside pursuit ($M = 4.94, SD = .92$) than outside pursuit/past museum visit ($M = 4.50, SD = 1.06$), $t(246) = 2.73, p = .007, d = .44$, or outside pursuit/future visit ($M = 4.56, SD = 1.09$), $t(246) = 2.37, p = .019, d = .37$, with no difference between past and future visits, $t < 1$. We obtain similar effects for immediate intrinsic incentives (past and future vs. present: $t(122) = 2.86, p = .005, d = .52$), and delayed intrinsic incentives (past and future vs. present: $t(121) = 1.72, p = .089, d = .31$), as indicated by the nonsignificant motivational State \times Timing (delayed vs. immediate) interaction, $F < 1$. We find no effect of motivational state, or a motivational State \times Timing (delayed vs. immediate) interaction, on the importance of extrinsic incentives, $F_s < 1$.

These results suggest that whereas people might value intrinsic incentives while pursuing a current museum visit, they give less value to these incentives when they are outside pursuit, either in

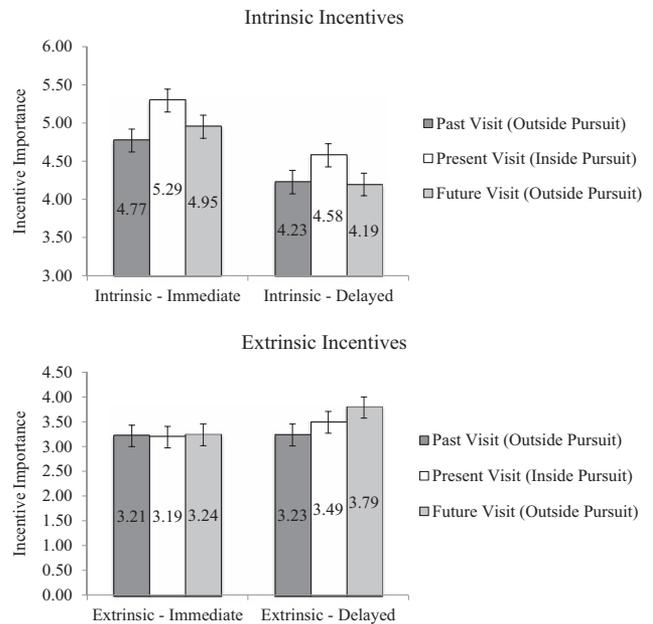


Figure 2. In Study 2, intrinsic incentives are rated as more important to museum guests inside a present visit than after a past or before a future museum visit. Extrinsic incentives do not differ in importance inside and outside (before or after) pursuit (lines in bars represent $\pm 1 SE$).

considering a future or past visit. For example, although feeling that their horizons are being broadened is important when evaluating a current museum visit, people do not see this as important in evaluating a past visit or in evaluating a future visit. We find the same pattern of valuation for intrinsic incentives that arrive immediately as we do for intrinsic incentives that arrive with a delay. Indeed, intrinsic incentives are valued more during pursuit than outside pursuit, regardless of timing (immediate vs. delayed), or whether the person outside pursuit is reflecting on a past or future visit. By contrast, we do not find a difference between the evaluation of extrinsic incentives inside pursuit (current visit) and outside pursuit (past or future visits).

Studies 1 and 2 document a shift in the valuation of intrinsic incentives in everyday activities that unfold over time. We expect this shift to occur also over short periods of time, for example, from the time people learn about an experimental task to the time they complete it, and test this hypothesis in our next study.

Study 3: Importance of Intrinsic Incentives for an Experimental Task

The goal of Study 3 was to document the shift in importance of intrinsic incentives in a more controlled and standardized experimental task. We developed a reading task in which participants have the opportunity to earn money through their work, and are free to stop the task at any time (that allowed us to assess task persistence in later studies). We predicted intrinsic (but not extrinsic) incentives would be more important to participants during pursuit of the reading task than outside pursuit.

Method

Participants. We predetermined a sample size of 100 (50 per condition) and opened up the study for 100 HITS on Amazon's Mturk. Mturk returned 102 (27 female) respondents, and before running any analyses, we decided to include all participants ($M_{\text{age}} = 30.80$, $SD = 9.76$). Participants received a base payment of \$0.25 for taking the study plus up to \$1.50 for completing the task.

Procedure. The study used a 2 (motivational state: outside vs. inside pursuit; between-subjects) \times 2 (incentives: intrinsic vs. extrinsic; within-subjects) mixed-model design. We developed a task that required participants to read and rate jokes and paid \$0.05 for every joke up to 30 jokes. Participants read we were pilot testing fun reading materials. After each trial (i.e., one joke), they answered a comprehension question and answered, "How funny is this joke?" (0 = *not at all*, 100 = *very funny*). One such example of a trial follows:

An Englishman, an Irishman, and a Scotsman were drinking in a pub, chatting idly. The subject of the conversation eventually turned to their sons.

"My son was born on St. George's Day," commented the Englishman. "So we obviously decided to call him George."

"Well, that's a real coincidence," remarked the Scotsman. "My son was born on St. Andrew's Day, so obviously we decided to name him Andrew."

"That's incredible; what a coincidence!" cried the Irishman. "Exactly the same thing happened with my son, Pancake!"

Participants read they could stop the study at any time by clicking on a "Stop" button at the end of the screen. They were also able to skip over jokes by clicking on a "Skip" button (27.5% of participants skipped some trials). We measured the importance of intrinsic and extrinsic incentives either before participants started the task (outside pursuit) or halfway through the task (inside pursuit). Specifically, in the before-pursuit condition, participants were asked the following: (a) "Before starting this task, is it important that the jokes are funny?" (intrinsic) and (b) "Before starting this task, is it important that you are paid well?" (extrinsic). Those in the inside-pursuit condition were asked the following questions midway through the task, after Trial 15 (for 23 out of 51 participants), or after the last trial they completed before they quit the task (28 out of 51): (a) "While working on this task, is it important that the jokes are funny?" (intrinsic) and (b) "While working on this task, is it important that you are paid well?" (extrinsic; 0 = *not at all important*, 6 = *extremely important*). Although we were mainly interested in the importance of intrinsic and extrinsic incentives for this study, we also recorded measures of persistence: (a) total trials completed ($M = 13.98$ out of 30 trials; $SD = 12.65$) and (b) total minutes spent on the task ($M = 9.75$ minutes, $SD = 11.17$). Participants earned an average bonus of \$0.70 ($SD = \0.63).

Results and Discussion

A repeated measures ANOVA of motivational state (outside vs. inside pursuit) on incentive importance (intrinsic vs. extrinsic) yielded a main effect of incentive, $F(1, 100) = 50.39$, $p < .001$, $\eta_p^2 = .34$ (extrinsic incentives were more important than intrinsic incentives; $M_{\text{extrinsic}} = 4.98$, $SD = 1.14$ vs. $M_{\text{intrinsic}} = 3.38$, $SD =$

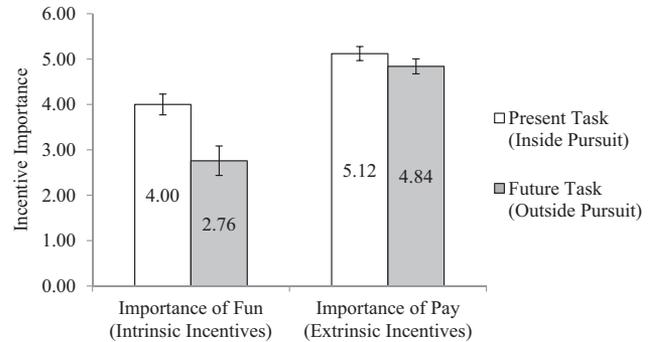


Figure 3. In Study 3, intrinsic incentives are rated as more important to people inside pursuit of a task than outside pursuit, whereas extrinsic incentives are similarly important inside and outside pursuit (lines in bars represent ± 1 SE).

2.09), and the predicted interaction, $F(1, 100) = 4.55$, $p = .035$, $\eta_p^2 = .04$ (see Figure 3).³ Participants valued intrinsic incentives more inside pursuit of the task ($M = 4.00$, $SD = 1.64$) than outside pursuit ($M = 2.76$, $SD = 2.32$), $t(100) = 3.11$, $p = .002$, $d = .65$. However, we find no difference in the importance of extrinsic incentives as a function of motivational state ($M_{\text{inside}} = 5.12$, $SD = 1.11$ vs. $M_{\text{outside}} = 4.84$, $SD = 1.17$), $t(100) = 1.22$, $p = .23$. Conditions did not differ on measures of persistence, $ts < 1$, suggesting stopping people in the middle of the task to ask them questions did not make them quit the task early.

This study provides evidence that intrinsic incentives are more important during pursuit of an experimental task than outside pursuit, whereas no corresponding difference exists in the importance of extrinsic incentives. We document this shift between motivational states that were very close in time; on average, those inside pursuit rated incentives less than 5 min after those outside pursuit. Thus, we document this shift in intrinsic incentive importance for distant future (Study 2), closer future (Study 1), and near future (Study 3).

So far, we have used participants' importance ratings to document the systematic shift in the valuation of intrinsic incentives. In the next study, we move to behavioral markers of this shift in importance, namely, task persistence. Specifically, we explore whether people fail to appreciate the strong influence of intrinsic incentives in advance, such that they neglect the role of intrinsic incentives on task persistence when outside pursuit.

Study 4: Intrinsic Incentives Increase Task Persistence

Study 4 examines the role of intrinsic incentives in pursuers' (inside pursuit) ability to follow through and persist on a task and contrasts pursuers' persistence with predictors' (outside pursuit) expectation for their own persistence. We hypothesized that people

³ We also performed a square-root transformation on intrinsic and extrinsic incentives to account for ceiling effects and negative skew. A repeated measures ANOVA using transformed variables finds a main effect of incentive, $F(1, 100) = 50.62$, $p < .001$, $\eta_p^2 = .34$, and a directional Pursuit \times Incentive interaction, $F(1, 100) = 2.55$, $p = .11$, $\eta_p^2 = .03$. More important, the effect of pursuit on intrinsic incentives remains significant, $t(100) = 2.79$, $p = .006$, $d = .55$, and the effect of extrinsic incentives remains nonsignificant, $t(100) = 1.28$, $p = .21$.

outside pursuit are less aware that intrinsic incentives are important inside pursuit and, thus, fail to predict these incentives will influence their future task persistence. In other words, we predicted that the same small difference in intrinsic incentives influences those inside pursuit and not those outside pursuit.

Specifically, we examined pursuers' actual persistence on fun versus boring tasks (intrinsic incentives) that offer low versus high pay (extrinsic incentives), and compared their persistence with the anticipated persistence of those making predictions outside pursuit. By fully crossing intrinsic and extrinsic incentives, we were able to test whether intrinsic incentives, rather than extrinsic incentives, drove pursuers' persistence (a main effect only for intrinsic incentives). By contrast, predictors should predict persisting equally as long on a boring task as on a fun task (no main effect for intrinsic incentives).

Method

Participants. We predetermined a sample size of 400 (50 per condition) and opened up the study for 400 HITs on Amazon's Mturk. Mturk returned 401 (165 female) respondents, and before running any analyses, we decided to include all participants ($M_{\text{age}} = 32.03$, $SD = 10.34$). All participants received a base fee of \$0.25 for taking part in the study and a bonus of up to \$1.50 or \$3.00, depending on the condition.

Procedure. The study used a 2 (motivational state: outside/predictors vs. inside/pursuers) \times 2 (intrinsic incentives: high vs. low) \times 2 (extrinsic incentives: high vs. low) between-subjects design. Participants were assigned to one of two tasks: a task higher on intrinsic incentives, whereby participants read sections from a joke book, or a task lower on intrinsic incentives that involved reading sections of a computer instruction manual. After each trial, participants answered one comprehension question: "How funny is this joke?" for the high intrinsic task or "How clear is this passage?" for the low intrinsic task (0 = *not at all*, 100 = *very funny/clear*). Both tasks included 30 trials and were designed to last up to 30 min. The high intrinsic task was taken from Study 3, and an example of a trial for the low intrinsic incentives task is below:

Ownership: You agree that you do not have any title to the product. You can only claim the title of owning the actual media. You agree that the product is protected under copy right laws. You agree that the software was made by a third party supplier. This third party is named in the copy right notices. These come with the software. The supplier may hold you responsible for any breach of this Agreement.

Participants were further assigned to a high or low extrinsic incentives condition. Those in the high extrinsic incentives condition read they would receive a \$0.10 bonus for every trial they completed, whereas those assigned to the low extrinsic incentives condition read they would receive a \$0.05 bonus for every trial completed.⁴

Participants were also assigned to the role of predictor or pursuer. Both predictors and pursuers expected to complete a task, although only pursuers did so. Predictors expected to complete the task on the following day and were asked to state their persistence predictions. Participants read about the task they were assigned to complete (high vs. low intrinsic incentives) and the specific payout structure (high vs. low extrinsic incentives). Participants also

learned they could end their task at any point by clicking a stop button on the screen and they could skip over a trial by clicking a skip button on the screen (33.2% of participants skipped some trials). Participants were only paid a bonus based on the number of trials they completed. After reading the instructions, predictors made their predictions for their own performance whereas pursuers completed the task.

Specifically, predictors were instructed to predict how well they will perform on this task tomorrow. They rated engagement: (a) "This task takes up to 30 min. Predict how long you will persist (in minutes) tomorrow" and (b) "This task has up to 30 trials. Predict how many you will answer before you stop, tomorrow." We also asked participants to predict the amount of money they would earn. Participants then ended the study without completing the task and were fully debriefed. For pursuers, we measured actual engagement: (a) number of trials completed and (b) amount of time participants spent on the task. We also recorded the amount of money participants earned in total.

Results and Discussion

Beginning with predictors outside pursuit, we first analyzed task persistence (total trials completed) as a function of intrinsic incentives (high vs. low) \times extrinsic incentives (high vs. low; see upper panel of Figure 4). Predictors expected to persist as long on a high intrinsic incentives task ($M = 25.24$, $SD = 7.06$) as on a low intrinsic incentives task ($M = 24.28$, $SD = 7.68$), $F < 1$. Predictors anticipated persisting directionally longer on a task with high extrinsic incentives ($M = 25.56$, $SD = 7.06$) than on a task with low extrinsic incentives ($M = 23.93$, $SD = 7.64$), $F(1, 198) = 2.62$, $p = .11$, $\eta_p^2 = .01$. The Intrinsic \times Extrinsic incentives interaction was not significant, $F = 1.44$, $p = .23$.⁵

A similar analysis of persistence (trials completed) for pursuers yielded only the predicted main effect of intrinsic incentives, $F(1, 195) = 21.41$, $p < .001$, $\eta_p^2 = .10$ (see lower panel of Figure 4). Pursuers persisted longer on a high intrinsic incentives task ($M =$

⁴ To confirm the difference between intrinsic incentives (jokes vs. manual) and extrinsic ones (low vs. high bonus) were of a similar magnitude for each incentive (i.e., joke task, computer manual task, task offering \$0.10 per question, task offering \$0.05 per question), we asked a group of 30 Mturk workers, "How attractive is it for you to do this task?" (1 = *not at all attractive*, 7 = *very attractive*). An ANOVA of attractiveness ratings revealed a main effect for extrinsic incentives (high extrinsic task (\$0.10): $M = 6.20$, $SD = 1.22$; low extrinsic task (\$0.05): $M = 4.73$, $SD = 1.96$), $F(1, 29) = 30.72$, $p < .001$, $\eta_p^2 = .51$, and a main effect for intrinsic incentives (high intrinsic task [jokes]: $M = 5.70$, $SD = 1.12$; low intrinsic task [computer manual]: $M = 3.83$, $SD = 1.80$), $F(1, 29) = 10.58$, $p = .003$, $\eta_p^2 = .27$. The interaction was nonsignificant, $F(1, 29) = 1.30$, $p = .26$. We note that these results are from a group of participants outside pursuit.

⁵ We also square-root transformed measures of persistence (trials completed and minutes) to account for a ceiling effect and negative skew, and find similar results. Trials completed: for predictors, we find no effect of intrinsic incentives, $F < 1$, a marginal effect of extrinsic incentives, $F(1, 198) = 3.29$, $p = .07$, $\eta_p^2 = .02$, and no interaction, $F = 1.61$, $p = .21$. For pursuers, we find a main effect of intrinsic incentives, $F(1, 195) = 16.95$, $p < .001$, $\eta_p^2 = .08$, with no other significant effects, $F_s < 1$. Minutes: for predictors, we find a main effect of extrinsic incentives, $F(1, 198) = 12.98$, $p < .001$, $\eta_p^2 = .06$, and no effect of intrinsic incentives, $F = 1.68$, $p = .20$, or interaction, $F = 1.88$, $p = .17$. For pursuers, we find a main effect of intrinsic incentives, $F(1, 195) = 16.48$, $p < .001$, $\eta_p^2 = .08$, with no effect of extrinsic incentives, $F = 2.11$, $p = .15$, or interaction, $F < 1$.

20.03, $SD = 9.72$) than on a low intrinsic incentives task ($M = 13.14$, $SD = 11.45$). We find no effect of extrinsic incentives on pursuers' actual persistence ($M_{\text{high}} = 16.22$, $SD = 11.75$ vs. $M_{\text{low}} = 17.58$, $SD = 10.30$), $F(1, 195) = 1.18$, $p = .28$. The Intrinsic \times Extrinsic incentives interaction was not significant, $F < 1$. Therefore, we find that whereas those outside pursuit are not sensitive to the presence of intrinsic incentives when predicting their persistence, and marginally sensitive to the presence of extrinsic incentives, the primary driver of pursuers' persistence inside a task is the presence of intrinsic incentives. Pursuers were further unaffected by the magnitude of the extrinsic benefit, possibly because the intrinsic incentives crowded out their attention.

We analyzed our second measure of task persistence (total minutes spent on task; see Figure 5) as a function of Intrinsic \times Extrinsic incentives for predictors and pursuers. For predictors, we find a main effect of extrinsic incentives, $F(1, 198) = 13.53$, $p < .001$, $\eta_p^2 = .06$ ($M_{\text{high}} = 24.28$, $SD = 7.01$; $M_{\text{low}} = 20.44$, $SD = 8.05$). As predicted, we find no main effect of intrinsic incentives, $F = 1.98$, $p = .16$ and no interaction, $F = 2.13$, $p = .15$. Thus, predictors were only sensitive to the magnitude of the extrinsic incentives. For pursuers, as predicted, we find only a main effect of intrinsic incentives, $F(1, 195) = 13.67$, $p < .001$, $\eta_p^2 = .07$ ($M_{\text{high}} = 20.17$, $SD = 12.31$; $M_{\text{low}} = 13.91$, $SD = 11.79$). We find no main effect of extrinsic incentives, $F = 1.46$, $p = .23$ or interaction, $F < 1$. Using another measure of

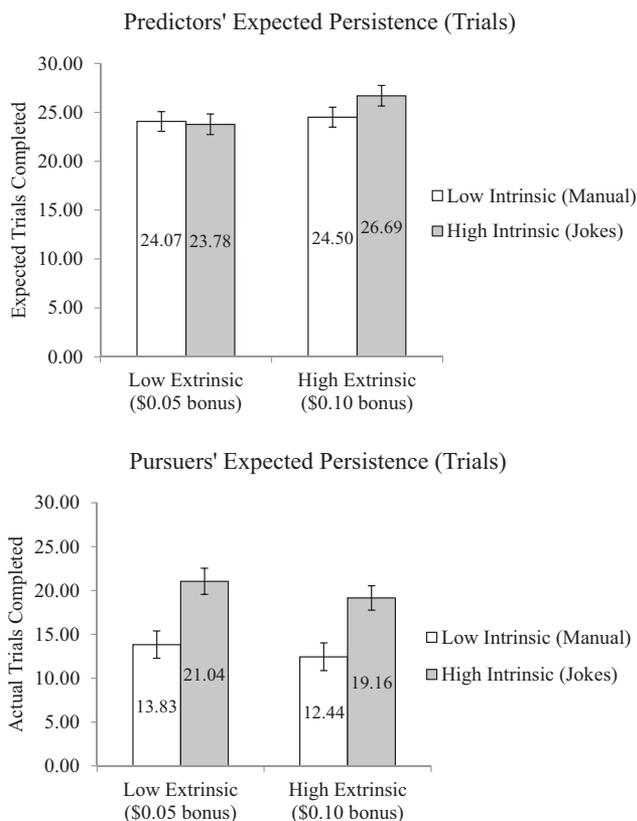


Figure 4. In Study 4, predictors outside a task failed to anticipate the importance of intrinsic incentives on persistence (trials completed), whereas the presence of intrinsic, but not extrinsic, incentives primarily drove pursuers' actual persistence (lines in bars represent ± 1 SE).

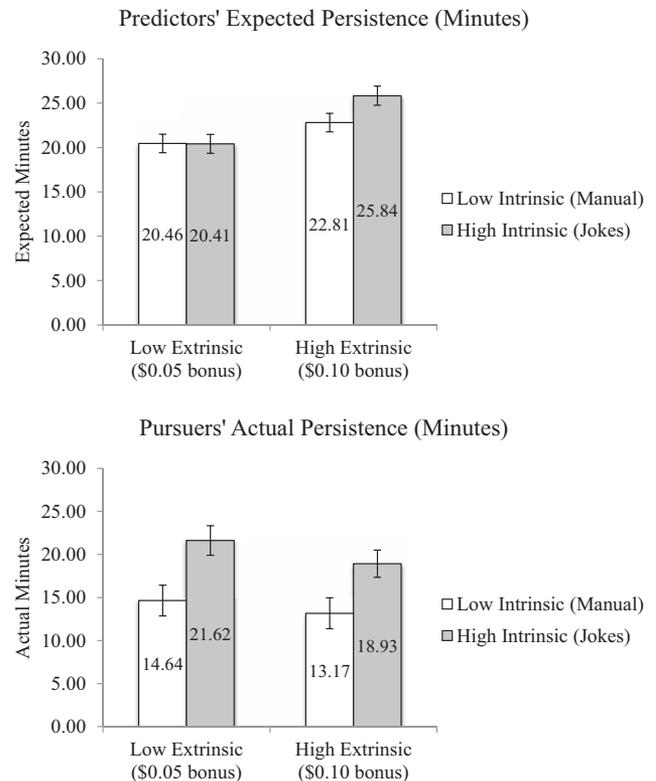


Figure 5. In Study 4, predictors outside of a task failed to anticipate the importance of intrinsic incentives on persistence (minutes completed), whereas the presence of intrinsic, but not extrinsic, incentives primarily drove pursuers' actual persistence (lines in bars represent ± 1 SE).

persistence, we again find those outside pursuit are not sensitive to intrinsic incentives, whereas they are sensitive to extrinsic ones. However, the presence of intrinsic incentives is what drives pursuers' persistence during pursuit, with no effect for extrinsic incentives.

Another approach is to analyze persistence (trials completed, minutes invested) as a function of intrinsic incentives (high vs. low) and motivational state (pursuer inside pursuit vs. predictor outside pursuit). The ANOVA yielded the predicted Motivational State \times Intrinsic incentives interaction for trials completed, $F(1, 397) = 10.64$, $p = .001$, $\eta_p^2 = .03$, and for minutes invested, $F(1, 397) = 5.54$, $p = .02$, $\eta_p^2 = .01$.⁶ For both persistence measures, these interactions indicate that whereas we find no effect of intrinsic incentives on predictors' anticipated persistence, pursuers persisted longer on a high intrinsic task than on a low intrinsic task.⁷

⁶ We find similar results using square-root transformed measures of persistence: interaction for trials completed, $F(1, 397) = 6.64$, $p = .01$, $\eta_p^2 = .02$; interaction for minutes, $F(1, 397) = 7.59$, $p = .006$, $\eta_p^2 = .02$.

⁷ We analyze pay, though because we operationalized extrinsic incentives as higher pay, this variable is less interesting and any main effect is less informative. For predictors, we find an effect of extrinsic incentives, $F(1, 198) = 259.88$, $p < .001$, $\eta_p^2 = .57$ ($M_{\text{high}} = \$2.67$, $SD = \$0.79$; $M_{\text{low}} = \$1.25$, $SD = \$0.39$), and no effect of intrinsic incentives or interaction, $F_s < 1$. For pursuers, we also find a main effect of extrinsic incentives, $F(1, 195) = 31.84$, $p < .001$, $\eta_p^2 = .14$ ($M_{\text{high}} = \$1.62$, $SD = \$1.17$; $M_{\text{low}} = \$0.88$, $SD = \$0.51$) and intrinsic incentives, $F(1, 195) = 16.89$, $p < .001$, $\eta_p^2 = .08$ ($M_{\text{high}} = \$1.52$, $SD = 0.95$; $M_{\text{low}} = \$0.96$, $SD = \$0.95$) with no interaction, $F = 1.53$, $p = .22$.

For pursuers inside pursuit, the presence of intrinsic incentives was the only factor driving persistence (number of trials, time). Predictors outside of pursuit did not anticipate the role intrinsic incentives would play in how long they would persist on a task, whereas they erroneously believed an increase in extrinsic incentives would correspond to an increase in persistence (marginal effect on time and significant effect on trials). These results suggest predictors underestimate the role of intrinsic incentives in shaping their performance during pursuit.

Notably, by selecting relatively small differences in intrinsic and extrinsic incentives, we were able to show that the same small difference in intrinsic incentives influences those inside pursuit, but not those outside pursuit, and the same small difference in extrinsic incentives influences those outside pursuit, but not those inside pursuit. And although an amount surely exists whereby both those inside and outside pursuit would be sensitive to the differences between high/low intrinsic and between high/low extrinsic incentives (e.g., if the tasks paid \$1 vs. \$100), we designed studies with differences in extrinsic incentives that are minimal such that those outside pursuit would be sensitive to the discrepancy, whereas those inside pursuit might not be. Thus, although our theory does not predict extrinsic incentives do not influence persistence during pursuit, or that intrinsic incentives have no impact on planning, these findings are consistent with the notion that when a higher weighting is placed on intrinsic incentives (inside pursuit), these incentives crowd out attention such that people may become insensitive to small differences between small amounts of extrinsic incentives. Correspondingly, when a smaller weighting is placed on intrinsic incentives (outside pursuit), people may become insensitive to small differences between small amounts of intrinsic incentives. This is especially true for decision weights when tasks trade off these incentives.

In our next study, we look for direct evidence that intrinsic incentives influence persistence by making the task more enjoyable (intrinsically motivating). Therefore, in Study 5, we measure positive experience, predicting that higher intrinsic, but not extrinsic incentives, increases positive experience, which mediates the effect of intrinsic incentives on persistence.

Study 5: Positive Experience Drives Persistence

The main objectives of Study 5 were to replicate Study 4 and test whether increased persistence on intrinsically rewarding tasks is driven by increased positive experience. Thus, in this study, we included measures of positive experience, expecting that adding intrinsic incentives to a task would lead to a greater positive experience during pursuit. Specifically, we predicted that those working on a more (vs. less) intrinsically rewarding task would enjoy their assigned task more, and that this increase in positive experience would mediate persistence.

Method

Participants. We predetermined a sample size of 200 (50 per condition) and opened up the study for 200 HITs on Amazon's Mturk. Mturk returned 199 (89 female) respondents, and before running any analyses, we decided to include all participants ($M_{\text{age}} = 34.68$, $SD = 11.34$). All participants received a base fee

of \$0.25 for taking part in the study and a bonus of up to \$1.50 or \$3.00, depending on the condition.

Procedure. The study used a 2 (intrinsic incentives: high vs. low) \times 2 (extrinsic incentives: high vs. low) between-subjects design. All participants were assigned to one of two tasks: a task higher on intrinsic incentives, whereby participants read sections from a joke book (identical to Studies 3–4), or a task lower on intrinsic incentives that involved reading sections of a computer instruction manual (identical to Study 4). All participants were further assigned to a high or low extrinsic incentives condition. The high extrinsic incentives condition paid \$0.10 for every trial completed, while the low extrinsic incentives condition paid \$0.05 per trial.

Participants read about the task they were assigned to complete (high vs. low intrinsic incentives) and the specific payout structure (high vs. low extrinsic incentives). As in Studies 3–4, participants could stop their task at any point or skip over trials (33.7% skipped); however, they only received a bonus for the total number of trials completed. After reading the instructions, participants began their task. We measured task persistence—(a) number of trials completed and (b) amount of time participants spent on the task—and recorded the amount of extrinsic incentives participants earned based on performance. We further measured positive experience after participants completed as many trials as they wanted to, but before they were paid ($\alpha = .94$): (a) “How dull was your task?” reverse-coded, (b) “How much fun was your task?” (c) “How boring was your task?” reverse-coded, and (d) “How enjoyable was your task?” (1 = *not at all*, 7 = *extremely*).

Results and Discussion

We first analyzed task persistence (total trials completed) as a function of intrinsic incentives (high vs. low) \times extrinsic incentives (high vs. low). An ANOVA revealed the predicted main effect of intrinsic incentives, replicating our findings from Study 4, $F(1, 195) = 15.39$, $p < .001$, $\eta_p^2 = .07$. Participants completed more trials when intrinsic incentives were high than when they were low (for low-pay task: $M_{\text{high}} = 15.49$, $SD = 12.42$ vs. $M_{\text{low}} = 11.77$, $SD = 10.95$; for high-pay task: $M_{\text{high}} = 17.57$, $SD = 10.67$ vs. $M_{\text{low}} = 9.04$, $SD = 9.72$). We find no main effect of extrinsic incentives on persistence, $F < 1$, or interaction between intrinsic and extrinsic incentives, $F = 2.36$, $p = .13$.⁸

We next analyzed our second measure of persistence, total minutes spent on the task, and again find a main effect of intrinsic incentives, $F(1, 195) = 4.10$, $p = .04$, $\eta_p^2 = .02$. Participants spent more time on a high intrinsic incentives task than a low intrinsic incentives task (for low-pay task: $M_{\text{high}} = 13.39$, $SD = 12.58$ vs. $M_{\text{low}} = 11.41$, $SD = 11.42$; for high-pay task: $M_{\text{high}} = 14.93$, $SD = 11.38$ vs. $M_{\text{low}} = 10.21$, $SD =$

⁸ We square-root transformed measures of persistence (trials completed and minutes) to account for floor effects and positive skew, and find similar results. For trials completed, we find an effect of intrinsic incentives, $F(1, 195) = 12.04$, $p < .001$, $\eta_p^2 = .06$, no effect of extrinsic incentives, $F < 1$, and a marginal interaction, $F(1, 195) = 3.16$, $p = .08$. For minutes, we find a main effect of intrinsic incentives, $F(1, 195) = 4.44$, $p = .04$, $\eta_p^2 = .02$, with no effect of extrinsic incentives, $F_s < 1$, or interaction, $F(1, 195) = 1.27$, $p = .26$.

11.15). We find no effect of extrinsic incentives or interaction, $F_s < 1$.⁹

We collapsed the four items measuring experience, and conducted an ANOVA of Intrinsic \times Extrinsic incentives on positive experience (see Figure 6). As predicted, there was a main effect of intrinsic incentives, $F(1, 195) = 98.38, p < .001, \eta_p^2 = .34$. Those pursuing a high intrinsic incentives task rated their experience more positively ($M = 4.90, SD = 1.55$) than those pursuing a low intrinsic incentives task ($M = 2.78, SD = 1.46$). There was a marginal effect of extrinsic incentives, $F(1, 195) = 3.65, p = .06, \eta_p^2 = .02$, where those receiving higher pay had a better experience than those receiving lower pay ($M_{\text{high}} = 4.09, SD = 1.86$ vs. $M_{\text{low}} = 3.68, SD = 1.81$), and no significant interaction, $F < 1$.

We predict that increased persistence on highly intrinsic tasks is driven by increased positive experience. We conducted a mediation analysis of intrinsic incentives on persistence (trials completed). The increase in positive experience fully mediated the effect of intrinsic incentives on persistence (β indirect = 1.77, $SE = .61$; 95% CI [.67, 3.07]; based on 10,000 bootstrap samples, Preacher & Hayes, 2004; here and in the next study, we report standardized betas). A task high (vs. low) on intrinsic incentives directly increased persistence ($\beta = .27, p < .001$) and increased positive experience ($\beta = .58, p < .001$). Positive experience directly increased persistence on the task ($\beta = .34, p < .001$). Controlling for positive experience reduced the impact of intrinsic incentives on persistence ($\beta = .12, p = .16$), whereas positive experience remained a significant predictor of persistence ($\beta = .27, p < .001$). There was no mediation through positive experience for extrinsic incentives (95% CI [-0.08, 1.10]).

Overall, Study 5 provides evidence for the process by which intrinsic incentives increase persistence. Adding intrinsic incentives led to a more positive experience, which allowed people to follow through on their assigned task longer. In comparison, whereas high (vs. low) extrinsic incentives marginally boosted experience, this was not enough for extrinsic incentives to influence task persistence.

An interesting question is why, in our paradigm, extrinsic incentives did not undermine intrinsic motivation as in the classic paradigm (Lepper & Greene, 1975). We could expect that strong extrinsic incentives would wash out the effect of intrinsic ones by

undermining intrinsic motivation. Instead, we predict and find a main effect of intrinsic incentives, regardless of the presence of extrinsic incentives. Possibly because social norms led to the expectation of extrinsic incentives (payment) for experimental tasks and because participants were initially extrinsically motivated (Staw, Calder, Hess, & Sandelands, 1980), extrinsic incentives did not undermine intrinsic incentives. Importantly, this finding suggests that these incentives operate independently and orthogonally; whereas intrinsic incentives increase persistence in our paradigm, extrinsic incentives do not.

In our next and last study, we examine another indicator of the shift in valuing intrinsic incentives inside and outside pursuit, using a situation that imposes a tradeoff between intrinsic and extrinsic incentives. In this study, we measure people's experience of regret when choosing between tasks trading off incentives, and predict that people who forgo an intrinsic (vs. extrinsic) task outside pursuit would regret their choice more at the moment of pursuit.

Study 6: Regretting Forgoing Intrinsic Incentives

In Study 6, we expected those who choose (outside pursuit) to pursue an activity lacking intrinsic incentives would come to regret their choice later, when they are inside pursuit, compared with those who choose to pursue an activity high on intrinsic incentives. To test this hypothesis, we assessed choice between experimental tasks that posed a tradeoff between intrinsic and extrinsic incentives (i.e., a fun task that paid less vs. a boring task that paid more). We did not orthogonally manipulate intrinsic and extrinsic incentives (as in Studies 4–5), because a choice paradigm requires that we do not present a dominating option that is high on both intrinsic and extrinsic incentives.

We designed the tradeoff such that in free choice, a majority of our lab participants would choose the task higher on extrinsic incentives and lower on intrinsic incentives. We tested whether another group of participants, whom we persuaded to supposedly “freely” choose the extrinsically (vs. intrinsically) rewarding task (i.e., forced choice), would then be more likely to regret their choice once they were inside pursuit. That is, we tested whether people are more likely to regret pursuing the option they would tend to freely choose over the option they would tend to forego.

Method

Participants. We predetermined and recruited a sample size of 120 city residents in a downtown lab facility to complete the study (60 assigned free-choice; 30 assigned forced-choice intrinsic

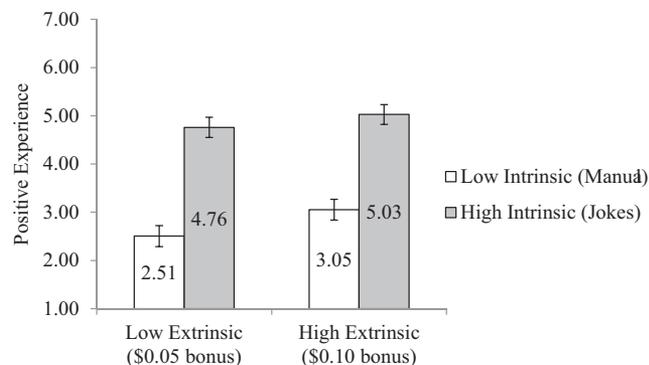


Figure 6. In Study 5, those pursuing a task high on intrinsic incentives had a more positive experience than those pursuing a task low on intrinsic incentives, regardless of the amount of extrinsic incentives that come from completing the task (lines in bars represent $\pm 1 SE$).

⁹ An ANOVA of Intrinsic \times Extrinsic incentives on pay yielded a main effect of intrinsic incentives, $F(1, 195) = 19.10, p < .001, \eta_p^2 = .09$ ($M_{\text{high}} = \$1.28, SD = \1.00 ; $M_{\text{low}} = \$0.75, SD = \0.80), and a main effect of extrinsic incentives, $F(1, 195) = 29.82, p < .001, \eta_p^2 = .13$ ($M_{\text{high}} = \$1.35, SD = \1.10 ; $M_{\text{low}} = \$0.69, SD = \0.59). There was also an Intrinsic \times Extrinsic incentive interaction, $F(1, 195) = 7.86, p = .006, \eta_p^2 = .04$. Participants pursuing a high-paying fun task earned more ($M = \$1.76, SD = \1.07) than those pursuing a low-paying fun task ($M = \$0.77, SD = \0.62), $t(102) = 5.71, p < .001, d = .99$, with only a marginal difference between high and low payment for the less fun task ($M_{\text{high}} = \$0.90, SD = \0.97 vs. $M_{\text{low}} = \$0.59, SD = \0.55), $t(93) = 1.95, p = .06, d = .39$. This finding suggests the presence of intrinsic incentives increased the effect of pay rate on how much money participants earned.

task; 30 assigned forced-choice extrinsic task). Two participants who failed to follow instructions and did not complete the study were excluded, leaving us with a sample size of 118 (40 female) participants ($M_{\text{age}} = 33.82$, $SD = 15.09$). Participants received monetary compensation (\$2.00 or \$2.25 depending on the condition).

Procedure. Participants were randomly assigned to the free-choice (inside pursuit/chooser) and forced-choice (outside pursuit/pursuer) conditions. Participants in the forced-choice group were further assigned to pursue the intrinsic task or extrinsic task.

Participants in the free-choice condition were given a choice between two tasks: a fun, low-paying task (higher on intrinsic, lower on extrinsic incentives) or a boring, high-paying task (lower on intrinsic, higher on extrinsic incentives). Specifically, participants learned they would be choosing between two tasks in which they would be evaluating different sounds. “Task A” (the intrinsic task) required participants to listen to a 1-min clip of “Hey Jude” by The Beatles and answer some questions for \$2.00. “Task B” (the extrinsic task) required participants to listen to a 1-min clip of an alarm clock going off and then answer some questions for \$2.25. Before making their choice, participants listened to a 5-s sample clip of each sound. Participants then chose a task to complete and answered end questions; however, we were mainly interested in their task selection, because they were not randomly assigned to a task.

Those in the forced-choice condition saw the same instructions as those in the free-choice condition. However, after listening to a sample of each clip, but before making a task choice, participants were instructed to get the research assistant, who randomly assigned participants to a task. The research assistant told participants the choice of a task was up to them, “But if you could choose Task A (*Task B*) it would really help us out. We need more people in that condition to finish up the study. It’s your own choice, but we’d really appreciate it if you choose Task A (*Task B*), does that work?” If participants were wavering or did not seem like they wanted to choose the suggested task, the research assistant was instructed to say, “It’s really your choice, but it would mean a lot if you chose Task A (*Task B*).” Participants then made their choice between tasks. Using this paradigm, participants felt like they were choosing, although in reality, they were assigned to condition (see also Festinger & Carlsmith, 1959; Helmreich & Collins, 1968). All participants who were instructed to get the research assistant complied with the choice recommendation and were randomly assigned to a task. They then listened to the 1-min clip they selected and answered end questions.

All participants answered end questions whereby we measured postchoice regret ($\alpha = .73$): (a) “To what extent do you regret your task choice?” (b) “How satisfied are you with the task you chose?” (reverse-coded), and (c) “How happy would you have been with the other task?” We measured these items as soon as participants finished the sound clip and before they were paid, while they were still “inside pursuit.” We also collected measures of positive experience as in Study 5 ($\alpha = .89$): (a) “How dull was your task?” (reverse-coded), (b) “How much fun was your task?” (c) “How boring was your task?” (reverse-coded), and (d) “How enjoyable was your task?” (1 = *not at all*, 7 = *extremely*).

Results and Discussion

In the free-choice condition, 73.33% ($n = 44$) chose the extrinsic task, which was significantly greater than chance, $\chi^2(1, N = 60) = 13.07$, $p < .001$, $\phi = .47$, suggesting that we designed a task where participants outside pursuit preferred extrinsic incentives.

We next analyze the results for the forced-choice condition. We collapsed the variables measuring positive experience, and confirmed that pursuing the extrinsic task was less enjoyable ($M = 3.45$, $SD = 1.63$) than pursuing the intrinsic task ($M = 4.99$, $SD = 1.73$), $t(56) = 3.49$, $p < .001$, $d = .92$. More important, we collapsed the measures of regret and, as predicted, those persuaded to pursue the extrinsic task regretted their choice more ($M = 3.11$, $SD = 1.44$) than those persuaded to pursue the intrinsic task ($M = 2.24$, $SD = 1.18$), $t(56) = 2.52$, $p = .015$, $d = .66$.

The increase in positive experience fully mediated the effect of task choice on feelings of regret (β indirect = $-.62$, $SE = .24$; 95% CI [$-1.21, -.25$]; based on 10,000 bootstrap samples, Preacher & Hayes, 2004). A task high (vs. low) on intrinsic incentives directly decreased regret ($\beta = -.32$, $p = .015$) and increased positive experience ($\beta = .42$, $p < .001$). Positive experience directly decreased choice regret ($\beta = -.56$, $p < .001$). Controlling for positive experience reduced the influence of task choice on regret ($\beta = -.10$, $p = .42$), whereas positive experience remained a significant predictor of regret ($\beta = -.52$, $p < .001$).

Although the free-choice condition was not randomly assigned, and thus, subject to selection bias, we find a similar pattern of results: the extrinsic task was less enjoyable ($M = 3.48$, $SD = 1.64$) than the intrinsic task ($M = 5.70$, $SD = 1.45$), $t(58) = 4.78$, $p < .001$, $d = 1.43$. More important, those who chose the extrinsic task regretted their choice during pursuit ($M = 3.34$, $SD = 1.44$) more than those who chose and pursued the intrinsic task ($M = 1.65$, $SD = .75$), $t(58) = 4.47$, $p < .001$, $d = 1.47$.

We find that whereas three quarters of our sample chose to complete the boring task, presumably because they were planning to compromise their experience to maximize their payoff, those we assigned and who were persuaded to choose the extrinsic task reported regretting their choice more than those assigned to choose the intrinsic task. This finding suggests people deciding to forgo intrinsic incentives in exchange for extrinsic incentives may be choosing something they will later regret. Of interest to the authors, participants in the forced-choice condition who regretted their choice came to regret a decision they did not actually make, because they were persuaded by a research assistant to choose the task they did.

Of course, it is also possible that participants regretted complying with social pressure and accepting the experimenter’s recommendation. However, this alternative cannot account for our findings, because social pressure existed in both conditions: participants could equally have regretted their choice to forgo a higher pay and their choice to forgo an interesting task. We find that they regretted their choice to forgo an interesting task more than their choice to forgo a high-paying task. Overall, this study shows the affective marker of valuing intrinsic incentives more inside pursuit than outside, namely, that people may come to regret their choice at the point of executing the action.

General Discussion

Six studies support our theory that people value intrinsic incentives inside more than outside pursuit. As a result, people rate these incentives as more important for present than past and future activities, persist on tasks that offer intrinsic incentives more than they anticipate outside pursuit, and come to regret their choice to forgo intrinsic incentives when they are inside pursuit. We document the increase in the importance of intrinsic incentives inside compared with outside pursuit, highlighting that this shift in incentive importance is unique to intrinsic incentives, because extrinsic incentives are valued similarly across motivational states (Studies 1–3). Further, we provide evidence that intrinsic incentives are valued more inside pursuit than outside because these incentives are associated with more immediate arrival (even when they are not actually arriving immediately, Study 2) and because positive experience motivates persistence during pursuit (Study 5). We also find that small differences in intrinsic incentives influence task persistence, although people outside pursuit do not anticipate such an effect (Study 4). Finally, we show this shift in importance of intrinsic incentives has implications for regret: those outside pursuit choose an activity they come to regret once engaged in the task (Study 6).

This systematic shift does not imply that at one point (i.e., either inside or outside of pursuit) evaluations are more accurate, or are closer to the “true self.” Indeed, one question following from this work is whether (or when) people outside an activity are strategic when they value intrinsic incentives less than their future “pursuer” will. Possibly, when outside pursuit, people wish to motivate their future self to collect extrinsic incentives rather than opt for intrinsic benefits. Indeed, the exercise of self-control often involves precommitting oneself to a course of action that is difficult to pursue but that offers delayed, extrinsic benefits (Ariely & Wertenbroch, 2002; Wertenbroch, 1998). For example, people precommit themselves to a yearlong gym membership to motivate their future self to exercise daily and achieve long-term health outcomes. Although people outside pursuit might strategically undervalue intrinsic incentives to maximize extrinsic payoffs, we note that we find a similar pattern of undervaluing these incentives post action (e.g., in evaluation of a past museum visit), when people do not wish to motivate themselves and should, therefore, be less strategic in their evaluations.

In our research, we focus on the importance of incentives inside and outside pursuit, which is separate from (yet has implications for) the decision weights placed on these incentives. Although the importance placed on one type of incentive should not take away from the importance placed on another type of incentive—for example, the importance placed on having a relaxing workout should not undermine the importance of receiving health benefits—in choice situations, valuing intrinsic incentives as more important could mean putting less value on extrinsic incentives because the choice poses a tradeoff, in which case valuation translates into decision weights. For example, in choosing between a more relaxing exercise and one that offers greater health benefits, valuing relaxation will result in placing more weight on it, and consequently, placing less weight on health benefits in choice. Indeed, participants in Study 6 faced a choice between two tasks—an interesting task that paid poorly and a dull task that paid well—and by placing less decision weight on interest outside

pursuit, they inevitably placed greater weight on pay, leading choosers to opt for the extrinsic task more often. However, because greater weight is placed on interest inside pursuit, lower weight is placed on pay, leading those choosing to forgo interest in exchange for higher pay to regret this decision during pursuit.

Whereas the focus of this article is on the valuation of intrinsic incentives, and we do not find systematic differences in the value assigned to extrinsic incentives, the above analysis has implications for evaluating extrinsic incentives inside and outside pursuit. We predict a shift in the importance of extrinsic incentives inside and outside pursuit when assigning decision weights, rather than simple evaluations. Specifically, whereas placing greater value on intrinsic incentives does not influence the value assigned to extrinsic incentives, assigning greater decision weight to intrinsic incentives in choice directly undermines the decision weight assigned to extrinsic incentives.

Our findings are further relevant to research showing that outside pursuit, people often mistakenly undervalue experience (i.e., intrinsic incentives) in maximizing psychological payoffs. For example, they underestimate the psychological benefits from experiential over material purchases (Carter & Gilovich, 2010; Van Boven & Gilovich, 2003) and they overweight the monetary value of an activity over the expected enjoyment of that activity (Hsee, Zhang, Yu, & Xi, 2003). Further, people overestimate the influence income has on psychological wellbeing, in particular for lower levels of household income (Aknin, Norton, & Dunn, 2009). Although we do not directly compare valuation of intrinsic incentives to extrinsic incentives, we note that one way to read these previous findings is that people underestimate the value of intrinsic incentives when planning (vs. pursuing) their actions.

Our research distinguishes between a self-regulatory state of planning and being outside pursuit. Planning provides a particular case of being outside pursuit, when people are preparing for upcoming actions (Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987). However, being outside pursuit also includes the state after pursuit, when one is reflecting on a previously completed action. For example, outside pursuit, people can reflect on what is important for them when traveling, either before they have traveled (planning) or after they are back from their trip. We find an increase in the valuation of intrinsic incentives inside pursuit compared with both before and after pursuit. Therefore, we do not find evidence that people lower the importance of intrinsic incentives in planning specifically, but that during pursuit, they see these incentives as more important.

Distinguishing between these two motivational states (inside and outside pursuit) naturally manipulates psychological distance. Previous work on temporal construal finds distance increases the weight of high-level, abstract value, and decreases the weight of low-level, concrete value (Trope & Liberman, 2003). An alternative to our hypothesis under this account could propose intrinsic incentives are low level, and thus, are more important in the present (close up) than outside pursuit (at a distance). Explaining our results in terms of construal level requires that intrinsic incentives are concrete whereas extrinsic incentives are abstract. However, we provide evidence demonstrating that intrinsic incentives are more abstract than extrinsic incentives (posttest to Study 1). Thus, we believe intrinsic incentives are more valuable inside pursuit because they are associated with immediate delivery rather than because of their level of abstractness.

Precondition and Implications

In this research, we measured the importance of intrinsic incentives. A precondition for the observed shift in incentive importance is that these intrinsic incentives are present in the first place. For example, a person listening to an unpleasant noise would not value the positive experience of listening to the sound more while listening than before, and a person working at a job that does not interest them would not value the interest of the job more inside than outside pursuit. For these people, intrinsic incentives do not exist in the first place, and thus, we would not expect them to become more important during pursuit than outside pursuit (although the absence of intrinsic incentives might be more apparent and bothersome during pursuit than before). Indeed, in our studies, we predict and find that only a person who has an enjoyable experience or pursues a somewhat interesting task would value intrinsic incentives more inside than outside pursuit. In general, we assume people place more value on intrinsic incentives when they experience them than when they do not, but this shift in importance does not generalize to the evaluation of missing incentives.

A practical implication from our research is for people to pay more attention to intrinsic incentives when making decisions outside pursuit. People should be careful not to neglect intrinsic incentives when choosing activities, because these incentives will be important to them inside pursuit. For example, when choosing a workout regimen, aspiring athletes should realize the positive experience of the workout will seem more important inside pursuit than outside, and can influence how long they actually persist on their workout. To follow through with the session, they should choose a workout activity they will enjoy pursuing. Similarly, dieters should realize that although taste might not matter to them before initiating a diet, to actually persist on their diet, they should choose to have a fulfilling and enjoyable (though low-calorie) eating experience.

Further, this research suggests implications for employers, educators, policymakers, and those who wish to motivate others. For example, employers trying to motivate employees should focus the employees on different aspects of the activity depending on the employees' motivational state. In the midst of pursuit, employers should focus employees on aspects of the activity that are internally rewarding, because doing so will increase persistence on the task as well as the overall experience on the job. However, outside pursuit, emphasizing the intrinsic incentives of that activity may not aid in initiating pursuit, because these incentives will be less important to employees.

Concluding Remarks

To summarize, although intrinsic incentives are important when a person is inside pursuit of an activity, these incentives matter less outside pursuit. People outside pursuit thus may not realize that pursuing activities containing intrinsic incentives and having a positive experience inside pursuit can lead them to persist longer on activities and regret their choices less.

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