JUST A LITTLE BIT OF ANTICIPATION: THE IMPACT OF REWARD ANTICIPATION ON PERSISTENCE

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Contribution Statement

Previous research has demonstrated that consumers experience enjoyment from anticipating a positive future experience (Loewenstein and Elster, 1992). However, prior research has not examined how anticipation, or the length of anticipation, of a reward affects reward enjoyment, task enjoyment, and persistence. In this paper, we demonstrate that (1) anticipating a reward is both enjoyable and motivating, but consumers can (2) adapt to the prospect of receiving a future reward over time, as well as (3) adapt to receiving the reward itself. Thus, we demonstrate that having a short period of anticipating rewards (i.e., rewards arrive after a short delay) leads to greater task enjoyment and persistence than having no period of anticipating rewards (i.e., rewards arrive immediately), or a long period of anticipating rewards (i.e., rewards arrive after a long delay). This research contributes to the literature on (1) anticipatory enjoyment (Loewenstein 1987) by revealing the impact of anticipating rewards, and the length of anticipating them, on persistence, (2) hedonic decline (Galak and Redden 2018), by demonstrating that consumers can adapt both to the prospect of receiving a reward as well as adapt to the reward itself, and (3) the goal-gradient hypothesis (Kivetz, Urminsky, and Zheng 2006), by suggesting that the relationship between proximity of reward and motivation is not always strictly linear as suggested by previous research.
Abstract

How does anticipation of a reward affect task enjoyment and persistence? And does the length of reward anticipation matter? Six studies (N = 4,514) demonstrate anticipating a reward is both enjoyable and motivating. However, because consumers can adapt to the prospect of a future reward over time, as well as adapt to the reward itself, consumers are most motivated, and most enjoy tasks, when they have a short period of anticipating rewards (i.e., a short delay before receiving rewards), than no period of anticipating rewards (i.e., rewards arrive immediately) or a long period of anticipating rewards (i.e., a long delay before receiving rewards). Together, our studies demonstrate that a short period of reward anticipation can reduce adaptation to the prospect of receiving a reward and delay adaptation to the reward itself, increasing task enjoyment and persistence relative to no period or a long period of reward anticipation.

Keywords: rewards, motivation, enjoyment, savoring, anticipatory enjoyment
Consumers are constantly struggling to reach their long-term goals, such as becoming more physically fit or learning a new language. As a result, many consumers seek out companies to help motivate them to reach these long-term goals. For example, consumers enroll in fitness programs such as CrossFit to become more physically fit and use language-learning programs, like Rosetta Stone or Duolingo, to learn a new language. The experience of working toward these long-term goals can be relatively unpleasant (e.g., working out may be difficult and studying vocabulary cards can be boring), and companies seek ways to encourage consumers to adhere to their program.

Companies can motivate consumers to continue to adhere to their program, and thus work towards these long-term goals, by offering small rewards (e.g., a small monetary discount on the program, points, badges, etc.). For example, imagine a fitness company, such as CrossFit, decides to reward their consumers to motivate them to continue with their fitness program. They have allocated a fixed budget for this rewards program (e.g., $15 savings on CrossFit membership per person) and are offering these rewards for a finite amount of time (e.g., 30 days). As consumers prefer immediate (vs. delayed) rewards (Ainslie 1975; Hoch and Lowenstein 1991; Thaler 1981), CrossFit might consider offering consumers a small reward every time they attend a workout session (e.g., a $0.50 savings for each session they attend, for 30 sessions). However, might delaying when consumers receive their reward actually be more motivating? In this research, we examine the impact of anticipating rewards on persistence, suggesting that there is a “sweet spot” in the length of anticipation that is motivating.

In particular, we predict that consumers are more motivated when there is a short delay (vs. no delay) before receiving a reward. For example, relative to the previous example, consumers will be more motivated if they do not receive a reward for their first 5 CrossFit
sessions, and then receive a reward for every session afterwards (30 sessions total) than if they start receiving rewards right away. We suggest this occurs for two reasons. First, we propose anticipating receiving a reward can cause the same, if not more, enjoyment than actually receiving the reward itself (Loewenstein 1987). Second, we suggest that consumers can adapt to rewards (Frederick and Loewenstein 1999; Galak and Redden 2018), and that a short period of anticipating rewards slows adaptation to the reward compared with receiving rewards right away. For these two reasons, greater or equal enjoyment from reward anticipation and slower adaptation when rewards start arriving, a short (vs. no) delay in reward provision can encourage consumers to persist longer.

If consumers derive enjoyment from anticipating rewards, and adapt to receiving the reward itself, then perhaps companies should introduce a larger delay for a single, larger reward. For example, CrossFit could give consumers a $15 savings on their membership after attending all 30 sessions. However, similar to how we suggest consumers adapt to rewards, we also predict that consumers will adapt to the prospect of a reward, leading anticipatory enjoyment of the reward to decrease over time. As a result, a short (vs. long) period of anticipating rewards reduces adaption to the prospect of a reward, increasing motivation.

To test our theory that anticipation of a reward is enjoyable and motivating, but that consumers can adapt to the prospect of the reward as well as to the reward itself, we compare consumers’ persistence when there is a short period of anticipating rewards (i.e., rewards arrive after a short delay) to their persistence when there is (1) no period of anticipating rewards (i.e., rewards arrive immediately), and (2) a long period of anticipating rewards (i.e., reward arrive after a long delay), holding total reward amount constant. In six real behavior studies, we demonstrate a short period of anticipating rewards increases task enjoyment and persistence by
delaying the decline in enjoyment from rewards, compared to no anticipatory period or a long
anticipatory period.

This work provides several new theoretical insights. First, we contribute to the research
on anticipation of enjoyable experiences (Loewenstein and Elster 1992). Building on this work,
we are the first to examine how anticipation of rewards influences task enjoyment and
persistence. We contribute to this research by examining how reward anticipation, as well as the
length of anticipation, influences reward enjoyment, task enjoyment, and motivation.

Further, our research is the first to demonstrate that consumers can adapt to the prospect
of receiving a future reward. We know from prior research that people experience enjoyment
when anticipating a future positive event (Loewenstein and Elster, 1992). However, prior
research has not examined the dynamics of anticipatory enjoyment and how it unfolds over time,
instead focusing on one-shot reports of experiences. We demonstrate that anticipatory enjoyment
of rewards declines over time during the initial stages of goal pursuit. Thus, the initial appeal of a
reward wears out over time even as it becomes closer to being realized.

In addition to demonstrating that consumers can adapt to the prospect of the reward, this
research is the first to demonstrate that consumers can adapt to rewards themselves. Unlike other
experiences prior research found consumers adapt to, such as listening to the same song or eating
the same food (Nelson and Meyvis 2008; Larson, Redden, and Elder 2014), monetary rewards
are a token used to buy a variety of items, and variety has been demonstrated to reduce hedonic
decline (Brondel et al. 2009, Epstein et al. 2009, Galak et al. 2011). Following from this, we
answer the open question of whether consumers adapt to monetary rewards.

In studying the effect of rewards on motivation, this research builds on the goal gradient
hypothesis (Kivetz, Urminsky, and Zheng 2006), which demonstrates that people are
increasingly more motivated the closer they are to accomplishing their goal. Our research suggests this relationship may not be as strictly linear as previously assumed; while consumers may be initially excited about the prospect of receiving a reward when they first pursue a task, this excitement fades in the early-middle stages of goal pursuit. Importantly, we demonstrate why this process occurs: consumers are initially excited about the prospect of a reward, but adapt to this prospect in the middle of goal pursuit.

We first review related literature on anticipatory enjoyment, hedonic decline, and affect transfer. We then present six real behavior studies using incentive compatible designs that demonstrate consumers persist more when experiencing a short period of reward anticipation compared with no period and a long period of reward anticipation.

**ANTICIPATION AND HEDONIC DECLINE IN REWARDS**

Anticipated events can affect consumers’ current utility (Kasl, Gore, and Cobb 1975; Farber 1953). Consumers can savor a future positive event by deriving positive utility from anticipation of the desired event. Savoring can lead consumers to experience the hedonic impact of future events repeatedly before they actually occur (Loewenstein and Elster 1992). For example, thinking about/anticipating a future concert can lead consumers to experience some positive utility/enjoyment in the present. Beyond enjoyment, savoring affects consumers’ behavior. Anticipating the utility of savoring a positive experience, consumers were willing to pay more to wait three days for a kiss from a movie star than to receive the kiss now (Loewenstein 1987). Building off this research, we predict that consumers will receive the same, if not more, enjoyment from *anticipating* receiving a reward than from actually receiving the
reward. Thus, a short (vs. no) period of reward anticipation does not decrease reward enjoyment while waiting for the reward.

A short period of reward anticipation can also benefit consumers after the anticipatory period has ended due to an additional novel prediction: consumers adapt to monetary rewards, and thus enjoy receiving monetary rewards less over time. This prediction is supported by research on hedonic decline, which found that repeated exposure to a stimulus reduces enjoyment of, and the desire to re-consume, the stimulus (Galak and Redden 2018). Consumers experience hedonic decline for many affectively relevant stimuli. They enjoy food less the more they eat it (Morewedge, Huh, and Vosgerau 2010; Larson et al. 2014) and music less the more they hear it (Nelson and Meyvis 2008). Hedonic decline can also occur for imagined consumption; consumers who imagined repeatedly consuming a food reported lower enjoyment and decreased their actual consumption as a result (Morewedge et al. 2010).

Despite the extensive research on hedonic decline, research has not explored whether people adapt to receiving repeated monetary rewards over time. The closest research demonstrated that people can adapt to positive events, such as salary increases and winning the lottery (Brickman, Coates, and Janoff-Bulman 1978; Kahneman and Deaton 2010; Frey and Stutzer 2002); however, this research does not disentangle whether consumers’ adapt to the money itself, as many other factors are confounded with increases in overall wealth. Further, unlike experiences previously shown to lead to hedonic decline (e.g., songs and food), monetary rewards are simply a token to buy a variety of items. Variety itself reduces hedonic decline (Brondel et al. 2009, Epstein et al. 2009, Galak et al. 2011). Following from this, it is plausible that consumers would not adapt to monetary rewards, as the reward represents a variety of items, rather than a single stimulus.
However, there is reason to believe consumers will adapt to repeated rewards. For one, consumers focus on the “medium” or token, rather than the outcome that results from the medium/token (Hsee, Zhang, and Zhang, 2003). If consumers focus on the token (e.g., monetary reward), rather than what the token represents (e.g., the variety of goods they can buy with the reward), they may adapt to monetary rewards. We thus predict that repeatedly rewarding consumers reduces enjoyment from receiving the reward, even though the objective value of the reward remains constant.

If consumers can adapt to monetary rewards, a short period of anticipating rewards may be beneficial, as it slows adaption to the reward itself compared with receiving rewards right away. As a result, we predict that a short (vs. no) period of reward anticipation will slow adaptation to receiving the reward itself. Thus, combining with our earlier prediction, a short anticipatory period of rewards causes enjoyment from reward anticipation, as well as delays adaption once rewards arrive, relative to no period of reward anticipation.

Whereas a short period of anticipating a reward can be motivating, there are limits to the motivation from reward anticipation. We propose that a long anticipatory period leads consumers to adapt to the prospect of receiving a reward. As mentioned earlier, when consumers first start a task that offers a delayed reward for either a short or long period of time, they experience high anticipatory enjoyment about the prospect of receiving the reward. In other words, anticipation of receiving a future reward causes enjoyment in the present. However, consumers with a long period of reward anticipation adapt to the prospect of the reward over time, reducing anticipatory
reward enjoyment in the early-mid stages of goal pursuit.\(^1\) That is, even as consumers become closer to receiving the reward, they receive less anticipatory enjoyment from it.

**AFFECT TRANSFER WITH GOALS & REWARDS**

Up to this point, we have theorized that over time, 1) anticipating a reward causes equal or greater enjoyment as actually receiving a reward, 2) consumers adapt to the prospect of receiving a reward, and 3) consumers adapt to the reward itself. Thus, consumers enjoy a reward (or the prospect of receiving a reward) less over time when they have no (or a long) reward anticipatory period. But how does decreased enjoyment of rewards affect motivation to persist in rewarded tasks over time? Building off of work on affect transfer in goals (Fishbach, Shah, & Kruglanski, 2004), we propose that diminishing reward enjoyment transfers to the rewarded task, reducing enjoyment of the task and decreasing task persistence.

We know that attaining a goal results in positive affect. The positive affect that characterizes goal attainment (e.g., excitement/enjoyment) transfers from the goal itself to the means through which the goal is pursued, depending on how strongly associated a means is with its goal (Fishbach, Shah, and Kruglanski 2004). This transfer is due to the cognitive aspects of goal systems (Kruglanski 1996)—means are associatively linked to goals. As a result, similar to other cognitive systems, properties of means can transfer to goals (Aarts and Dijksterhuis 2003; Chartrand and Bargh 1996; Moskowitz, Gollwitzer, Wasel, and Schall 1999). For example, if

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\(^1\)This research focuses on the decline in anticipatory enjoyment in the beginning-mid stages of goal pursuit. We discuss possibilities about the trajectories of anticipatory enjoyment as consumers approach the reward in the General Discussion.
running (a means) is strongly associated with weight loss (a goal), positive affect from the possibility of losing weight transfers to the act of running, causing greater enjoyment of running.

Receiving a reward is itself attaining a goal. As a result, when consumers are rewarded for a task, they enjoy the activity more because the positive value of the reward transfers over to the activity itself (Woolley and Fishbach 2018). For example, if a consumer receives a $0.15 bonus for a task, they feel excited about receiving this $0.15 bonus, and this excitement transfers to the task, causing greater task enjoyment.

Both the emotional tone and magnitude of affect that characterize goal attainment (e.g., excitement) can transfer from goals to means (Fishbach et al. 2004). A decrease in positive affect from receiving a reward over time, should accordingly result in decreased enjoyment of completing the task over time. Consequently, consumers who receive rewards right away and experience no period of reward anticipation should experience decreased task enjoyment over time as they adapt to receiving the reward (and thus experience less enjoyment from the reward). Relatedly, consumers who need to wait a long period before receiving rewards should also experience decreased task enjoyment over time, because they adapt to the prospect of receiving rewards (and thus experience less enjoyment from the prospect of the reward). Decreased task enjoyment should accordingly decrease persistence, as consumers are more likely to persist and complete tasks that they enjoy (Kruglanski et al 2018; Woolley and Fishbach 2017).

Overall, we predict that consumers with a short period of reward anticipation will persist more than those with no reward anticipation or a long period of reward anticipation. First, these consumers focus on the prospect of the reward, receiving as much, if not more, enjoyment from anticipating the reward than actually receiving the reward. Later, once the anticipatory period is over, these consumers focus on the reward itself. Due to the shift in what these consumers focus
on and receive enjoyment from, they adapt less to the prospect of the reward relative to those who anticipate their reward for a longer period of time, and adapt to the reward itself later than those not experiencing a period of anticipation. As a result, a short period of anticipation delays the decline in reward enjoyment over time, causing greater task enjoyment and persistence relative to no period or a long period of anticipation. More formally:

**H1:** Consumers persist longer in a task when they have a short (vs. no) period of reward anticipation.

**H2:** Consumers persist longer in a task when they have a short (vs. long) period of reward anticipation.

**H3:** Consumers’ increased persistence with a short (vs. no or long) period of reward anticipation is serially mediated by a slower decrease in enjoyment from the reward, which increases task enjoyment (see Figure 1)

**FIGURE 1**
**FIGURE OF PROPOSED PROCESS**

Six real behavior studies support our predictions. We first demonstrate that a short (vs. no) period of reward anticipation increases task persistence (study 1), which is mediated by a
delayed decline of task enjoyment over time (study 2). We next demonstrate that a short period of reward anticipation increases persistence compared to both no period of reward anticipation and a long period of anticipation (studies 3-6), which is mediated by increased task enjoyment (study 4). Further, in study 5, we reveal that consumers with no period of anticipating rewards adapt to their reward over time, while those with a long period of reward anticipation adapt to the prospect of the reward over time, leading to lower task enjoyment and persistence. However, consumers with a short period of reward anticipation adapt less to the prospect of the reward, and adapt to the reward itself later in goal pursuit, increasing task enjoyment and persistence relative to those with a large amount and no anticipation of rewards. Lastly, study 6 further provides evidence for our process and addresses alternate explanations, such as consumers’ motivation is driven by 1) differences in reward structure, 2) attempts to reach a target amount of money, and 3) a preference for increasing sequences.

**STUDY 1: A SHORT PERIOD OF REWARD ANTICIPATION (VS. NO PERIOD OF ANTICIPATION) INCREASES FLOSSING OVER 12 DAYS**

Study 1 examined the effectiveness of a short (vs. no) period of reward anticipation in motivating consumers to floss their teeth. While all of our studies examine the effects of anticipation of rewards on real behavior, this study examined behavior that has an important consequence for consumers’ health in a longitudinal study.

**Method**

We preregistered this study at: [http://aspredicted.org/blind.php?x=kp3ez6](http://aspredicted.org/blind.php?x=kp3ez6). In this study, participants were incentivized to floss their teeth for 12 days and needed to upload a picture of
themselves flossing each day as evidence of this behavior. Thus, this study required participants to 1) have floss available for 12 days, and 2) be willing to upload pictures of themselves flossing. So that participants could acquire floss, interested participants signed up a few days before the start of the 12-day study. As pre-registered, we opened the hit for 3,000 workers on Amazon’s Mechanical Turk (MTurk), as we anticipated people may not complete the study (e.g., because they did not have floss).

A total of 1,703 participants signed up for this study. When participants signed up, they were asked about the frequency of their past flossing behavior, “How often do you floss your teeth?” from “Less than once a week” to “2x a day or more.” Participants were then informed that they could receive a bonus contingent on the number of days they flossed their teeth for a total of 12 days. They learned the details on Day 1 of the 12-day study. To qualify for this study, participants needed to floss their teeth on the first day of the study. This requirement was meant to ensure that all participants had the necessary supplies to participate and were capable of uploading a photo of themselves flossing starting from Day 1 of the 12-day study.

Participants were randomly assigned to one of two conditions on Day 1 of the 12-day study: the No Anticipation condition or the Short Anticipation condition. In the No Anticipation condition, participants were paid $0.24 each day they flossed their teeth. In the Short Anticipation condition, they were not paid for the first three days that they flossed their teeth. However, after three days, they received $0.32 for every day they flossed their teeth. Thus, participants in Short Anticipation condition anticipated receiving a reward over a three-day period. If participants flossed for 12 days, they would be eligible for $2.88 in both conditions.

Note that across all studies, the total bonus participants could earn was constant across conditions. Thus, those in the Short (vs. No) Anticipation condition earned slightly more per day,
after three days of flossing without a bonus. Given the very small difference in payment, (which participants were not aware given the between-subjects design), this should not affect persistence. Second, if total bonus amount was not constant across conditions, this would introduce a confound in the magnitude participants were (or were not) anticipating. Third, many companies allocate a fixed amount of money as a reward bonus, as indicated in the opening example with CrossFit; thus we believe this payment allocation is the most realistic. Importantly, in study 6, we directly rule out this alternate explanation, by demonstrating that a larger continuous reward is not more motivating than a smaller continuous reward.

All participants learned their goal was to floss their teeth for all 12 days of the study to hold participants’ goal in the study constant. To ensure participants understood the reward structure, on Day 1 we required participants to pass an attention check. Eighty-six percent of participants passed the attention check; those who did not pass the attention check were not eligible to participate, leaving our final sample at 647 participants (Mage = 34.22; Age Range = 18-74; 231 Males).

Results

We conducted a linear regression predicting total number of days flossed from a dummy variable representing the conditions, with the Short Anticipation condition as the reference group. As predicted, participants in the Short (vs. No) Anticipation condition flossed significantly more days ($M_{\text{NoAnticipation}} = 6.96$, $SD = 4.29$; $M_{\text{ShortAnticipation}} = 8.03$, $SD = 4.33$; $\beta = -1.07$, $SE = .34$, $t(645) = -3.15$, $p = .002$; 95% CI = [-1.73, -.402]; figure 2). We also examined if our effect held when controlling for participants’ prior flossing behavior; we found no significant
interaction of participants’ prior flossing behavior × condition ($\beta = -.17$, SE = .28, $t(643) = -.62$, $p = .53$; 95% CI [-.710, .368]).

**FIGURE 2**
STUDY 1: NUMBER OF DAYS FLOSSED BY CONDITION

![Bar chart showing number of days flossed by condition.](chart.png)

*Note:* Bars represent +/- SE.

**Discussion**

Study 1 provided initial evidence that a short period of reward anticipation increases persistence compared with no period of reward anticipation in a consequential domain. Those who received no rewards for three days, and then began receiving rewards flossed 15% more than those who started to receive rewards right away. This study demonstrates that a short period of reward anticipation leads consumers to outperform those with no period of reward anticipation for a consequential behavior that many consumers struggle to enact. We next examine the process behind this effect, moving to tasks that are still mildly unpleasant, similar to many self-control behaviors consumers are motivated to engage in, but that we can study in a controlled
setting. We choose these tasks to parallel the tasks that companies must motivate consumers to complete in the real world (e.g., study vocabulary cards, exercise, etc.).

**STUDY 2: SHORT (VS. NO) PERIOD OF REWARD ANTICIPATION INCREASES TASK ENJOYMENT OVER TIME**

Study 2 begins examining our proposed process. We predict that a short period of reward anticipation leads consumers to experience anticipatory enjoyment of receiving the reward. Then, once they begin to receive rewards, they are slower to adapt to these rewards than those who do not experience reward anticipation. We expect that this greater enjoyment, from anticipating the reward and from adapting slower to the reward, increases task enjoyment over time as enjoyment from the reward transfers over to the task, leading to greater persistence. In particular, Study 2 examined if a short period of reward anticipation delays the decline in task enjoyment relative to those with no period of anticipation, leading to greater persistence.

Note that we examine how consumers’ enjoyment of the task changes over time due to adaptation to the *reward*. Because being rewarded is a positive experience, and people enjoy completing rewarded tasks (Fishbach et al. 2004; Woolley and Fishbach 2018), we expected that adaptation would lead consumers to find the experience *less* enjoyable over time, rather than more enjoyable over time, as is the case for negative experiences.

Method

We preregistered this study at: http://aspredicted.org/blind.php?x=5rd8yk. A total of 799 participants ($M_{age} = 38.19$; Age Range = 18-87; 358 Males) completed this study on MTurk. Participants were asked to type a series of 100 CAPTCHAs (strings of blurry/scrambled letters),
with a goal to type all 100 of the CAPTCHAs. Participants were randomly assigned to one of two conditions (No Anticipation vs. Short Anticipation). In the No Anticipation condition, participants received a 1.2 cent bonus for every CAPTCHA they typed. In the Short Anticipation condition, participants received no bonus for the first 20 CAPTCHAs; after typing CAPTCHAs, they received a 1.5 cent bonus for every CAPTCHA they typed. Thus, participants in Short Anticipation condition anticipated their reward for 20 CAPTCHAs. If participants typed all 100 CAPTCHAS, they would be eligible for $1.20 in both conditions.

To measure task enjoyment, we required participants to type 30 CAPTCHAs. After typing 5, 10, 15, 20, 25, and 30 CAPTCHAs, we asked participants two questions, “Up to this point, how much are you enjoying completing this CAPTCHA task?,” and “Up to this point, how much does the CAPTCHA task feel like work vs. fun?” on a 100-point scale from 0 = “Not at all” to 100 = “A lot.” These questions allowed us to assess how enjoyment changes over time in the initial stages of goal pursuit when experiencing a short (vs. no) period of reward anticipation.

To measure how changes in enjoyment over time affects persistence, after typing 30 CAPTCHAS, participants could quit the typing task at any point (from CAPTCHAs 31-100). This choice would affect the amount of bonus that they earned depending on condition. The total number of CAPTCHAs participants typed served as our real-behavior measure of persistence.

Results

We first conducted a linear regression predicting total number of CAPTCHAs typed from one dummy variable representing the conditions, with the Short Anticipation condition as the reference group. We replicated the results from study 1: participants in the Short Anticipation condition typed significantly more CAPTCHAs than those in the No Anticipation condition.
($M_{\text{No Anticipation}} = 78.03$, $SD = 30.45$; $M_{\text{Small Anticipation}} = 82.75$, $SD = 28.25$; $\beta = -4.73$, $SE = 2.08$, $t(797) = -2.28$, $p = .023$; 95% CI = [-8.81, -.652]; figure 3).

**FIGURE 3**

STUDY 2: NUMBER OF CAPTCHAS TYPED BY CONDITION

![Graph showing comparison between Short Anticipation and No Anticipation conditions](image)

*Note: Bars represent +/- SE.*

We computed task enjoyment at each time point by averaging our two task enjoyment questions ($\alpha$s > .90) (after typing 5, 10, 15, 20, 25, and 30 CAPTCHAs). We examined the average enjoyment of the task in the first 20 CAPTCHA trials; during this period, participants in the Short Anticipation condition were not yet rewarded for their actions, while those in the No Anticipation condition were rewarded. We predicted that during this period, participants in the Short Anticipation condition would enjoy the task as much, if not more, than those in the No Anticipation condition. Indeed, we found that consumers with a short period of reward anticipation enjoyed the task similarly, if not slightly more, while waiting for their reward, compared with those who were actually rewarded ($M_{\text{No Anticipation}} = 40.20$, $SD = 30.63$; $M_{\text{Short Anticipation}} = 41.48$, $SD = 33.14$; $\beta = -1.29$, $SE = 2.26$, $t(797) = -.57$, $p = .569$; 95% CI [-5.72,
This is an important component of our proposed process. Since consumers in the Short Anticipation condition were not rewarded during this time period, it is feasible to assume they would enjoy the task significantly less during this time than those who were rewarded, decreasing motivation to complete the task. However, we instead find that anticipating rewards causes consumers to enjoy the task slightly more than actually receiving rewards.

We next examined the change in task enjoyment over time for the first 30 CAPTCHAs. We expected that participants with no period of reward anticipation would enjoy the task less over time, because they adapt to receiving the reward. We further expected that the introduction of the later-arriving reward in the Short Anticipation condition would delay reward adaptation, such that this group would experience a delay in the decline of task enjoyment relative to those in the No Anticipation condition. We thus preregistered and tested the following analysis: Across both conditions, we computed the difference between the average enjoyment of the task before typing up to 20 CAPTCHAs (before the reward was introduced in the Short Anticipation condition) and the average enjoyment of the task after typing 20 CAPTCHAs (after the reward was introduced in the Short Anticipation condition). As pre-registered and predicted, we found that this difference score was significantly smaller (and less negative) in the Short (vs. No) Anticipation condition ($M_{\text{NoAnticipation}} = -5.98$, $SD = 11.05$; $M_{\text{ShortAnticipation}} = -2.69$, $SD = 8.91$; $\beta = -3.28$, $SE = 0.71$, $t(797) = -4.63$, $p < .001$; 95% CI [-4.67, -1.89]; figure 4). This suggests that there was a reduced decline in task enjoyment in the early stages of goal pursuit in the Short (vs. No) Anticipation condition due to the introduction of a later-arriving reward.
We also examined whether participants enjoyed the task less over time within both conditions. We conducted a paired sample t-test, assessing if there was a statistical difference between task enjoyment when typing the first 20 CAPTCHAs (i.e., before the reward was introduced in the Short Anticipation condition), and after typing 20 CAPTCHAs (i.e., after the reward was introduced in the Short Anticipation condition). Participants experienced less task enjoyment over time in both the No Anticipation condition ($M_{\text{EarlyEnjoyment}} = 40.20$, $SD = 30.63$; $M_{\text{LaterEnjoyment}} = 34.22$, $SD = 31.89$; $t(390) = 10.70$, $p < .001$; 95% CI [4.88, 7.07]) and the Short Anticipation condition ($M_{\text{EarlyEnjoyment}} = 41.48$, $SD = 33.14$; $M_{\text{LaterEnjoyment}} = 38.79$, $SD = 33.62$;
Notably, this analysis suggests that a short period of anticipation before receiving rewards does reduce, but does not eliminate, decreased task enjoyment over time in the early stages of goal pursuit.

This reduced decline in task enjoyment significantly mediated the effect of total CAPTCHAs typed; (β = -.74, SE = .42, 95% CI [-1.70, -.056]), with no significant direct effect (95% CI = [-8.10, .120]), indicating that participants with a short period of reward anticipation had a reduced decline in enjoyment in the earlier stages of goal pursuit (B_{indirect} = -2.14, SE = .51, 95% CI = [-3.14, -1.14], increasing persistence (B_{indirect} = .35, SE = .14, 95% CI = [.062, .63]).

Discussion

Study 2 conceptually replicated the findings of study 1 and demonstrated initial evidence for why consumers with a short (vs. no) period of reward anticipation persist longer. Introducing rewards later in goal pursuit delays the decline in task enjoyment in the Short Anticipation condition (relative to those in the No Anticipation condition), leading to greater persistence.

**STUDY 3: A SHORT PERIOD OF REWARD ANTICIPATION INCREASES PERSISTENCE COMPARED WITH NO AND A LONG PERIOD OF REWARD ANTICIPATION**

Studies 1-2 examined how a short (vs. no) period of reward anticipation affects persistence and task enjoyment (H1). However, our theory predicts that a short period of reward anticipation will also lead consumers to persist more than those with a long period of reward anticipation (H2). More specifically, we propose that consumers with a long period of reward anticipation will adapt to the prospect of the reward; as a result, they will experience a decline in anticipatory enjoyment of the reward during the initial stages of goal pursuit, leading to lower
task enjoyment and persistence. However, consumers with a short (vs. long) period of reward anticipation will adapt less to the prospect of the reward because they begin receiving rewards earlier, leading to greater task enjoyment and persistence. Study 3 examines this prediction.

Method

We preregistered this study at http://aspredicted.org/blind.php?x=3d6ae4. A total of 905 participants (Mage = 36.45; Age Range = 18-76; 357 Males) on MTurk completed the study. Participants were asked to type 60 sets of words backwards. Each set consisted of three words. Participants were randomly assigned to one of three conditions (Long vs. Short vs. No Period of Reward Anticipation). All participants were told that their goal was to type all 60 of the word sets backwards. Participants in the No Anticipation condition received a 1 cent bonus for every set they typed backwards. Participants in the Short Anticipation condition received no bonus for the first 20 sets; after 20 sets, they received an additional 1.5 cent bonus for every set they typed backwards. Thus, participants in the Short Anticipation condition anticipated their reward for 20 sets. To examine the impact of a long (vs. short) period of reward anticipation, the Long Anticipation condition represents the most extreme case, such that consumers anticipated receiving their reward for the entire length of the task. Participants in the Long Anticipation condition received a $0.60 bonus if they typed all of the sets backwards. Thus, participants in the Long Anticipation condition anticipated receiving their reward for all 60 sets. Across conditions, if participants typed all 60 sets, they would receive a $0.60 bonus.

After each set, participants had the option to skip typing the remaining words. We measured the number of sets participants typed as our real behavior measure of persistence.
Results

We conducted a linear regression predicting total number of word sets typed from two dummy variables representing the conditions, with the Short Anticipation condition as the reference group. As predicted, participants in the Short Anticipation condition typed significantly more sets than those in the Long Anticipation condition ($M_{\text{Long Anticipation}} = 23.47$, $SD = 25.42$; $M_{\text{Short Anticipation}} = 28.93$, $SD = 25.06$; $\beta = -5.46$, $SE = 2.05$, $t(903) = -2.66$, $p = .008$; 95% CI [-9.49, -1.43]) and the No Anticipation condition ($M_{\text{No Anticipation}} = 23.89$, $SD = 24.63$; $M_{\text{Short Anticipation}} = 28.93$, $SD = 25.06$; $\beta = -5.04$, $SE = 2.04$, $t(903) = -2.47$, $p = .014$; 95% CI [-9.04, -1.04]; figure 5)

FIGURE 5
STUDY 3: NUMBER OF WORD SETS TYPED BY CONDITION

Note: Bars represent +/- SE.

Discussion
Study 3 replicated studies 1-2 by demonstrating that a short period of reward anticipation increases persistence compared to no period of reward anticipation in another domain. Further, this study demonstrated that a short period of reward anticipation increases persistence than a long period of reward anticipation.

**STUDY 4: A SHORT PERIOD OF REWARD ANTICIPATION INCREASES PERSISTENCE BY INCREASING TASK ENJOYMENT**

Study 4 aimed to replicate the effect of greater persistence with a short period of reward anticipation compared to both a long and no period of reward anticipation in a new domain. We further examined our proposed process, that a short period of reward anticipation increases persistence by increasing overall task enjoyment compared to both no period of anticipation and a long period of reward anticipation.

While study 2 was beneficial in demonstrating how enjoyment changes over time as a function of length of reward anticipation (for no vs. a short period of anticipation), merely reporting these enjoyment measures may have affected task persistence. To more cleanly measure task persistence, as well as examine the relationship between task enjoyment and persistence, study 4 measured task enjoyment at the end of the survey. We expected that the delayed decline in task enjoyment over time in the Short (vs. No and Long) period of reward anticipation condition would result in greater overall enjoyment at the end of the task. This increased task enjoyment would then mediate the effect of greater task persistence in the Short Anticipation condition (vs. No Anticipation and Long Anticipation conditions).

Method
A total of 300 participants on MTurk completed this study. Participants were assigned to find the definitions of 40 words on dictionary.com and copy and paste the definitions into the Qualtrics survey. Participants were told their goal was to define all 40 words. Participants were randomly assigned to one of three reward conditions (Long vs. Short vs. No Period of Reward Anticipation). Participants in the No Anticipation condition received a one cent bonus for every two words they defined. Participants in the Short Anticipation condition received no bonus for the first 20 words they defined; after defining 20 words, they received a one cent bonus for every word they defined. Thus, participants in the Short Anticipation condition anticipated their reward for 20 words. Participants in the Long Anticipation condition received a 20-cent bonus if they defined all 40 words. Thus, participants in the Long Anticipation condition anticipated their reward for 40 words.

Across conditions, if participants defined all 40 words, they would earn a 20-cent bonus. At the end of the study we measured task enjoyment: “How much did you enjoy completing this task?” from 1 = “Not at all enjoy” to 7 = “Enjoy a lot.”

Results

We conducted a linear regression predicting total number of words defined from two dummy variables representing the conditions, with the Short Anticipation condition as the reference group. Participants in the Short Anticipation condition persisted longer; they defined significantly more words than those in the Long Anticipation condition ($M_{Long\text{Anticipation}} = 21.94$, $SD = 17.56$; $M_{Short\text{Anticipation}} = 30.31$, $SD = 15.67$; $\beta = -8.37$, SE = 2.38, $t(297) = -3.51$, $p = .001$; 95% CI = [-13.06, -3.68]) and the No Anticipation condition ($M_{No\text{Anticipation}} = 23.35$, $SD = 17.16$).

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2 Age and gender information were not collected due to a survey error. Demographics should be similar to the other studies reported in this paper.
\[ M_{\text{Long Anticipation}} = 3.42, \ SD = 2.08; \ \beta = -0.96, \ SE = 0.29, \ t(297) = -3.36, \ p = .001; \ 95\% \ CI [-1.53, -0.398] \] and the No Anticipation condition
\[ M_{\text{No Anticipation}} = 3.77, \ SD = 1.85; \ M_{\text{Short Anticipation}} = 4.39, \ SD = 2.13; \ \beta = -0.62, \ SE = 2.89, \ t(297) = -2.13, \ p = .034; \ 95\% \ CI [-1.19, -0.046]; \] figure 7).

**FIGURE 6**

**STUDY 4: NUMBER OF VOCABULARY WORDS DEFINED BY CONDITION**

Note: Bars represent +/- SE.

We conducted another regression predicting task enjoyment, which revealed that participants in the Short Anticipation condition enjoyed the task significantly more than those in the Long Anticipation condition (\[ M_{\text{Long Anticipation}} = 3.42, \ SD = 2.08; \ M_{\text{Short Anticipation}} = 4.39, \ SD = 2.13; \ \beta = -0.96, \ SE = 0.29, \ t(297) = -3.36, \ p = .001; \ 95\% \ CI [-1.53, -0.398] \] and the No Anticipation condition (\[ M_{\text{No Anticipation}} = 3.77, \ SD = 1.85; \ M_{\text{Short Anticipation}} = 4.39, \ SD = 2.13; \ \beta = -0.62, \ SE = 2.89, \ t(297) = -2.13, \ p = .034; \ 95\% \ CI [-1.19, -0.046]; \].
Lastly, using the multicategorical Model 4 PROCESS macro (Hayes 2013), we found that task enjoyment significantly mediated the effect of total words defined between the Long Anticipation and the Short Anticipation conditions ($\beta = -3.86, SE = 1.26, 95\% CI [-6.55, -1.57]$), indicating participants with long period of reward anticipation enjoyed the task less than those with a short period of reward anticipation ($B_{\text{indirect}} = -0.96, SE = 0.29, 95\% CI = [-1.52, -0.398]$), which reduced persistence ($B_{\text{indirect}} = 4.00, SE = 0.42, 95\% CI = [3.17, 4.84]$).

Similarly, task enjoyment mediated the effect between the No Anticipation and Short Anticipation conditions on persistence ($\beta = -2.47, SE = 1.17, 95\% CI [-4.80, -0.25]$), indicating participants with no anticipation of rewards enjoyed the task less than those with a short period of reward anticipation ($B_{\text{indirect}} = -0.62, SE = 0.29, 95\% CI = [-1.18, -0.046]$), which reduced persistence ($B_{\text{indirect}} = 4.00, SE = 0.42, 95\% CI = [3.17, 4.84]$).

Discussion
Study 4 replicated study 3, providing additional evidence that consumers are more likely to persist with a short period of reward anticipation than a long or no period of reward anticipation (H1 and H2). Further, we provide additional evidence for the underlying process: Consumers enjoyed the task more with a short period of reward anticipation than a long period of reward anticipation or no period of reward anticipation, leading them to persist more.

**STUDY 5: CHANGES OVER TIME IN ENJOYMENT OF THE REWARD/ENJOYMENT OF THE PROSPECT OF THE REWARD**

Up to this point, we have demonstrated that a short period of reward anticipation increases persistence by increasing task enjoyment. We suggest that this increased task enjoyment is driven by a delayed decline from reward enjoyment relative to experiencing a long or no period of reward anticipation. That is, greater persistence when experiencing a short (vs. no or a long) period of reward anticipation is serially mediated by task enjoyment, which is influenced by a delayed decline in reward adaptation (H3).

In particular, we suggest that consumers with a long period of reward anticipation will adapt to the *prospect* of the reward, and thus experience less anticipatory enjoyment over time. Consumers with no period of reward anticipation will adapt to the reward itself, such that they enjoy the reward less over time. On the other hand, a short period of reward anticipation shifts what consumers focus on and adapt to, which increases task enjoyment and persistence. First, these consumers focus on the *prospect* of the reward, similar to those experiencing a long period of anticipation. However, consumers experiencing a short period of anticipation do not adapt to the prospect of receiving the reward, like those with a long period of reward anticipation do, as they begin to receive rewards earlier. In addition, once consumers with a short period of reward
anticipation start receiving rewards, they adapt later to the reward compared to those with no period of reward anticipation, as waiting to receive rewards slows the rate of adaption.

Study 5 tested for changes in enjoyment of the reward/enjoyment of the prospect of the reward over time. Further, this study examined if changes in enjoyment of the reward/enjoyment of the prospect of the reward influence enjoyment and subsequent persistence in the task (H3).

Method

We preregistered this study at: http://aspredicted.org/blind.php?x=ak4jp6.

A total of 1047 participants (Mage = 35.86; Age Range = 18-83; 465 Males) on MTurk completed this study. As in study 2, participants were asked to type a series of 100 CAPTCHAs, with the goal to type all 100 CAPTCHAs. We randomly assigned participants to one of three conditions (No vs. Short vs. Long Period of Reward Anticipation). In the No Anticipation condition, participants received a 1.2 cent bonus for every CAPTCHA they typed. In the Short Anticipation condition, participants received no bonus for the first 20 CAPTCHAs; after typing 20 CAPTCHAs, they received a 1.5 cent bonus for every CAPTCHA they typed. Thus, participants in the Short Anticipation condition anticipated their reward for the first 20 CAPTCHAs. In the Long Anticipation condition, participants received $1.20 if they typed all 100 CAPTCHAs. Thus, participants in this condition anticipated their reward for all 100 CAPTCHAs. Across all conditions, participants could earn a total bonus of $1.20 for typing all 100 CAPTCHAs.

To measure actual and anticipatory enjoyment from rewards across conditions, participants were required to first type 30 CAPTCHAs. After completing 5, 10, 15, 20, 25, and 30 CAPTCHAs, participants in the No Anticipation condition indicated their “enjoyment of receiving the reward,” specifically “How much enjoyment did you experience now from earning
the bonus for typing this set of 5 CAPTCHAs?” on a 100-point scale from 0 = “Not at all” and 100 = “A lot.” Participants in the Long Anticipation condition indicated their “anticipatory enjoyment of receiving the reward”: “How much enjoyment did you experience now from the prospect of earning a bonus in the future?” on a 100-point scale from 0 = “Not at all” and 100 = “A lot.” For participants in the Short Anticipation condition, we measured anticipatory enjoyment before they started receiving rewards (i.e., after completing 5, 10, 15, and 20 CAPTCHAs), similar to the Long Anticipation condition. We measured actual reward enjoyment once these participants started to receive their bonus (i.e., after completing 25 and 30 CAPTCHAs), similar to the No Anticipation condition. This study was thus similar to study 2, but rather than measuring task enjoyment, we measured reward enjoyment over time.

After typing 30 CAPTCHAs, participants had the option to stop typing the CAPTCHAs at any point. The number of CAPTCHAs they typed affected the bonus they received and was our real behavior measure of persistence. Once they stopped typing CAPTCHAs, they were redirected to the end of the survey. At the end of the survey, similar to study 4, we measured overall task enjoyment: “How much did you enjoy working on the CAPTCHA task?” with 0 = “Did not enjoy at all” and 100 = “Enjoyed a lot.”

Results

We conducted a linear regression predicting total number of CAPTCHAs typed from two dummy variables representing the conditions, with the Short Anticipation condition as the reference group. Replicating study 3 and 4, participants in the Short Anticipation condition typed significantly more CAPTCHAs than those in the Long Anticipation condition ($M_{LongAnticipation} = 79.10, SD = 30.98; M_{ShortAnticipation} = 83.65, SD = 28.86; \beta = -4.54, SE = 2.30, t(1044) = -1.97, p =$
.049; 95% CI = [-9.07, -.023]) and the No Anticipation condition ($M_{\text{NoAnticipation}} = 76.12$, $SD = 31.62$; $M_{\text{ShortAnticipation}} = 83.65$, $SD = 28.86$; $\beta = -7.53$, $SE = 2.28$, $t(1044) = -3.30$, $p = .001$; 95% CI = [-12.01, -3.05]; figure 8).

**FIGURE 8**

STUDY 5: NUMBER OF CAPTCHAS TYPED BY CONDITION

Note: Bars represent +/- SE.

We next examined if anticipating receiving a reward can lead to as much enjoyment, if not more, than receiving the reward itself. To test this, we examined the average enjoyment from the reward in the first 20 CAPTCHA trials. During this time period, participants in both the Short and Long Anticipation conditions were not yet rewarded for their actions, while those in the No Anticipation condition were rewarded. We found that anticipating receiving a reward can provide MORE enjoyment than actually receiving the reward in the beginning stages of goal pursuit. Indeed, participants in both the Short and Long Anticipation conditions experienced more enjoyment from anticipating their reward than those in No Anticipation condition did from
actually receiving their rewards during the initial stages of goal pursuit ($M_{\text{Short Anticipation}} = 59.62$, $SD = 31.37$; $M_{\text{No Anticipation}} = 46.04$, $SD = 32.89$; $\beta = 13.58$, $SE = 2.41$, $t(1044) = 5.63$, $p < .001$; 95% CI = [8.85, 18.31]; $M_{\text{Long Anticipation}} = 56.79$, $SD = 32.34$; $M_{\text{No Anticipation}} = 46.04$, $SD = 32.89$; $\beta = 10.75$, $SE = 2.47$, $t(1044) = 4.35$, $p < .001$; 95% CI = [5.90, 15.60]; figure 9). As noted earlier, this finding is important: it is reasonable to assume participants would experience more enjoyment from actually receiving the reward, than anticipating the reward. The enjoyment from anticipating the reward further ensures consumers with a short period of reward anticipation continue with the task, rather than dropping out.

Next, we examined how enjoyment from the reward changes over time. Our theory predicts participants adapt to the prospect of the reward in the Long Anticipation condition and adapt to the reward itself in the No Anticipation condition. Thus, in both the Long and No Anticipation conditions, we expected enjoyment from the reward (due to receiving or anticipating rewards) to decrease over time. Further, we expected that decline in enjoyment from the reward would be greater in the initial stages of goal pursuit for those in the Long and No Anticipation conditions than those in the Short Anticipation condition.

Since we theorized that the introduction of the bonus in the Short Anticipation condition would offset the reduction in enjoyment from the reward over time, we preregistered the following analysis. We computed the difference between the average enjoyment when typing up to 20 CAPTCHAs (before receiving rewards in the Short Anticipation condition) and the average enjoyment after typing 20 CAPTCHAs (after receiving rewards in the Short Anticipation condition). We found that this difference score was significantly smaller in the Short versus No Anticipation condition ($M_{\text{No Anticipation}} = -5.28$, $SD = 12.71$; $M_{\text{Short Anticipation}} = -1.74$, $SD = 13.67$; $\beta = -3.54$, $SE = 1.01$, $t(1044) = -3.51$, $p < .001$; 95% CI = [-5.53, -1.56]) and the Long Anticipation
condition \( (M_{\text{Long Anticipation}} = -6.41, \ SD = 14.08; \ M_{\text{Short Anticipation}} = -1.74, \ SD = 13.67; \ \beta = -4.68, \ SE = 1.02, \ t(1044) = -4.59, \ p < .001; \ 95\% \ CI = [-6.69, -2.68]; \ \text{figure 9}).^{3} \) This smaller difference suggests that adaptation was delayed in the Short versus No Anticipation condition due to the delayed onset of rewards in the Short Anticipation condition. Further, this suggests that consumers did not adapt as much to the prospect of receiving the reward in the Short Anticipation condition compared to the Long Anticipation condition. Thus, there was less of a reduction of enjoyment from the reward (either in the form of enjoyment from the reward itself or the form of anticipating the reward) in the initial stages of goal pursuit in the Short Anticipation condition than in both the No and Long Anticipation conditions.

We also examined whether participants’ enjoyment from the reward (either in the form of anticipatory enjoyment or enjoyment of the reward itself) declined over time across all three conditions. We conducted a paired sample t-test, assessing if there was a difference between the average enjoyment from the reward/prospect of the reward up to typing 20 CAPTCHAs (i.e., before receiving the reward in the Short Anticipation condition), and after typing 20 CAPTCHAs (i.e., after receiving the reward in the Short Anticipation condition). Across all conditions, participants experienced less enjoyment from the reward over time; No Anticipation: \( M_{\text{Early Enjoyment}} = 46.04, \ SD = 32.89; \ M_{\text{Later Enjoyment}} = 40.76, \ SD = 33.97; \ t(345) = 7.72, \ p < .001; \ 95\% \ CI [3.93, 6.62]; \) Long Anticipation: \( M_{\text{Early Enjoyment}} = 56.79, \ SD = 32.35; \ M_{\text{Later Enjoyment}} = 50.37, \ SD = 34.71; \ t(332) = 8.32, \ p < .001; \ 95\% \ CI [4.90, 7.94]; \) Short Anticipation: \( M_{\text{Early Enjoyment}} = 59.62, \ SD = 31.37; \ M_{\text{Later Enjoyment}} = 57.88, \ SD = 33.62; \ t(367) = 2.43, \ p = .015; \ 95\% \ CI [.333, 3.14]. \) This suggests that a short period of reward anticipation reduces, but does not eliminate, the decrease in reward enjoyment in the initial stages of goal pursuit.

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\(^3 \) We pre-registered an additional analysis examining the association between the reward and task that we report in the Web Appendix as it is not the primary hypothesis tested in this paper.
Next, we examined participants’ overall task enjoyment. Participants in the Short Anticipation condition enjoyed the task significantly more than those in the No Anticipation condition ($M_{\text{No Anticipation}} = 44.23$, $SD = 35.71$; $M_{\text{Short Anticipation}} = 53.65$, $SD = 28.86$; $\beta = -8.34$, $SE = 2.64$, $t(1041) = -3.16$, $p = .002$; 95% CI = [-13.52, -3.17]) and marginally more than those in the Long Anticipation condition ($M_{\text{Long Anticipation}} = 47.49$, $SD = 34.63$; $M_{\text{Short Anticipation}} = 53.65$, $SD = 28.86$; $\beta = -5.07$, $SE = 2.67$, $t(1041) = -1.90$, $p = .057$; 95% CI = [-10.32, .161]; figure 10).
Lastly, using the multicategorical Model 6 PROCESS macro (Hayes 2013), we tested for serial mediation evidence of our proposed effect (figure 11). As predicted, participants in the No Anticipation condition experienced a greater decline in enjoyment from the reward in the initial stages of goal pursuit compared to the Short Anticipation condition, ($B_{\text{indirect}} = -3.54, SE = 1.01$, 95% CI = [-5.53, -1.55]), which decreased overall task enjoyment ($B_{\text{indirect}} = .40, SE = .08$, 95% CI = [.239, .552]), and reduced persistence ($B_{\text{indirect}} = .16, SE = .03$, 95% CI = [.111, .215]), with a significant index for the indirect effect (index = -.23, SE = .09, 95% CI = [-.43, -.09]; 10,000 resamples); and a reduced direct effect (95% CI [-10.14, -1.27]).

We found similar serial mediation evidence for the effect of long period of reward anticipation versus a short period of reward anticipation on persistence (figure 12). Participants in the Long Anticipation condition adapted to the anticipatory enjoyment of the reward in the

Note: Bars represent +/- SE.
initial stages of goal pursuit, experiencing a greater decline in enjoyment from the reward compared to the Short Anticipation condition ($B_{\text{indirect}} = -4.67, SE = 1.02, 95\% \text{ CI} = [-6.68, -2.66]$), which decreased overall task enjoyment ($B_{\text{indirect}} = .40, SE = .08, 95\% \text{ CI} = [.55, .24]$), and reduced persistence ($B_{\text{indirect}} = .16, SE = .03, 95\% \text{ CI} = [.111, .215]$), with a significant index for the indirect effect ($\text{index} = -.30, SE = .10, 95\% \text{ CI} = [-.52, -.13]; 10,000 \text{ resamples}; \text{ and no significant direct effect} 95\% \text{ CI } [-7.58, 1.41]$).

**FIGURE 11**
STUDY 5: MEDIATION DIAGRAM FOR SHORT (VS. NO) PERIOD OF REWARD ANTICIPATION

**FIGURE 12**
STUDY 5: MEDIATION DIAGRAM FOR SHORT (VS. LONG) PERIOD OF REWARD ANTICIPATION

Discussion
Study 5 replicated our main effect and also provided crucial process evidence. First, we found that consumers initially experience greater enjoyment from anticipating the reward than actually receiving it. Thus, in line with study 2, anticipating rewards does not decrease enjoyment compared with actually receiving rewards. Second, we demonstrate consumers with a long period of reward anticipation adapt to the prospect of the reward over time and those with no period of reward anticipation adapt to the reward itself over time. As a result, consumers with long anticipation have lower anticipatory enjoyment about the prospect of receiving the reward over time and consumers with no anticipation enjoy receiving rewards less over time. However, consumers with a short period of reward anticipation experience a delayed decline in enjoyment from the reward over time, increasing their overall task enjoyment, and persistence relative to those with a long (vs. no) period of reward anticipation.

These findings thus offer important insights. First, consumers experience greater enjoyment from merely anticipating the reward, than actually receiving it. While consumers might prefer earlier rewards (Thaler 1981), they actually enjoy and are more motivated by rewards that are slightly delayed. This is related to study 2, which found that consumers enjoy the task similarly when anticipating (vs. actually receiving) their reward. We believe the reason consumers do not enjoy the task significantly more is because reward enjoyment is just one input into task enjoyment. By directly measuring reward enjoyment and anticipatory reward enjoyment, as in study 5, we more cleanly examine the role of anticipation in enjoyment of rewards.

Second, this study is the first to demonstrate that consumers adapt to rewards. Unlike previous research, money is a token that can be used to buy a variety of items. It is thus plausible that consumers do not adapt to monetary rewards, as the reward represents a variety of items,
rather than a single stimulus. However, in our studies, it appears consumers focus on the token (e.g., monetary reward), rather than what the token represents (e.g., the variety of goods they can buy with the reward; Hsee et al. 2003), leading them to adapt to rewards.

Third, we demonstrate that consumers can even adapt to the prospect of a reward. Consumers receive less anticipatory enjoyment about the reward the closer they become to reaching it (at least in the early-mid stages of goal pursuit). Based off of research on the goal gradient effect (Kivetz et al. 2006) and intertemporal choice (Ainslie 1975; Hoch and Lowenstein 1991; Thaler 1981), we might expect that consumers would receive more enjoyment from anticipating the reward as they become closer to receiving the reward. However, we instead find the opposite to be true, at least in the initial stages of goal pursuit.

**STUDY 6: THE EFFECT OF ANTICIPATION AND CONTINUOUS REWARDS ON TASK PERSISTENCE**

So far, we have demonstrated that the length of reward anticipation affects adaption to the prospect of the reward, and adaption to the reward itself once the reward is received. As a result, we suggest that a short (vs. long or no) period of reward anticipation is more motivating.

In our previous studies, we compared the impact of a short period of reward anticipation to an extreme case of a long period of reward anticipation (i.e., those who anticipated receiving their reward for the entire task), and to no period of reward anticipation. In doing so, participants in the Short Anticipation condition received larger, continuous rewards, those in the No Anticipation condition received smaller, continuous rewards, and those in the Long Anticipation received one lump sum of money at the end of the task. Thus, a possible alternative explanation for our finding is that larger, continuous rewards are more motivating than smaller, continuous rewards.
rewards, and more motivating than one lump sum reward. To address this alternative explanation, the current study introduced a new condition, termed Long Anticipation-Continuous, which examined consumers’ persistence when anticipating rewards for 75/100 tasks before receiving a slightly larger continuous reward, $0.03 for the remaining 25 tasks. We compared this to our traditional Short Anticipation condition, now called Short Anticipation-Continuous, which required completing 25/100 tasks before receiving a slightly smaller continuous reward, $0.01, for the remaining 75 tasks. Our theory predicts that consumers in the Short Anticipation-Continuous condition will be more motivated than those in the Long Anticipation-Continuous condition, as those with a long period of reward anticipation will adapt to the prospect of the reward.

Thus, this study allows us to examine this alternative explanation that the Short Anticipation-Continuous condition leads to greater motivation due to its reward structure, rather than its length of anticipation. That is, receiving larger continuous rewards in the Short Anticipation-Continuous condition is more motivating than receiving smaller continuous rewards, or a single lump sum reward. If this alternate explanation were true, consumers in the Long Anticipation-Continuous Rewards condition would persist more than those in the Short Anticipation-Continuous Rewards condition, as they receive larger continuous incentives (e.g., $0.03 vs. $0.01). However, based on our theory, we would predict the opposite effect.

This study also addresses the alternative explanation that the motivational benefits of a short period of reward anticipation occurs because consumers have a target goal for how much they want to earn, and need to work longer to earn this amount. First, we note that decreased persistence in the Long (vs. Short) Anticipation condition in our previous studies rules out this alternative (if this alternative were true, we should see the greatest persistence in the Long
Anticipation condition). The current study provides an even stronger test of this alternate explanation. If consumers were indeed trying to reach a financial target, then consumers in the Long Anticipation-Continuous Rewards condition should persist longer than those in the Short Anticipation-Continuous Rewards condition. However, based on our theory, we predict the opposite effect.

Further, a third alternative explanation is that consumers may prefer increasing sequences, which drives motivation in the Short Anticipation-Continuous condition. If this were true, we would expect no difference between the Long Anticipation-Continuous and the Short Anticipation-Continuous condition, as they are both increasing sequences. However, based on our theory, we predict that the Short Anticipation condition causes significantly greater persistence.

**Method**

A total of 816 participants (Mage = 35.28; Age Range = 18-82; 337 Males) on MTurk completed this study. Participants were asked to type 100 word sets, with each word set consisting of three words. All participants were told their goal was to type all 100 sets. Participants were randomly assigned to one of four conditions (No Anticipation, Short Anticipation-Continuous, Longer Anticipation-Continuous, Longest Anticipation-Lump Sum). Participants in the No Anticipation condition received a $0.0075 bonus for every set they typed. Thus, they did not experience a period anticipating their rewards. Participants in the Short Anticipation condition received no bonus for the first 25 sets they typed, and began receiving a $0.01 bonus for every set after typing 25 sets. Thus, they anticipated receiving rewards for 25 sets. Those in the Longer Anticipation-Continuous Rewards condition received no bonus for the
first 75 sets they typed, and began receiving a $0.03 bonus for every set after typing 75 sets. Thus, they anticipated receiving their reward for a longer period of time, for 75 word sets. Participants in the Longest Anticipation-Lump Sum condition received a $0.75 bonus if they typed all 100 sets. Thus, they anticipated receiving their reward for the longest of the conditions, for all 100 sets. Across conditions, participants could earn a total bonus of $0.75 if they typed all 75 sets. At the end of the study, we measured “How much did you enjoy completing this task?” from 1 = “Not at all Enjoy” to 7 = “Enjoy a lot.”

Results

We first conducted a linear regression predicting total number of sets typed from three dummy variables representing the conditions, with the Short Anticipation-Continuous condition as the reference group. As predicted, participants in the Short Anticipation-Continuous condition typed significantly more sets than those in the No Anticipation condition ($M_{NoAnticipation} = 41.04$, SD = 42.41; $M_{ShortAnticipation-Continuous} = 65.01$, SD = 41.52; $\beta = -23.96$, SE = 4.26, $t(812) = -5.63$, $p < .001; 95\%$ CI = [-32.32, -15.61]), the Longer Anticipation-Continuous condition ($M_{LongerAnticipation-Continuous} = 55.05$, SD = 44.68; $M_{ShortAnticipation-Continuous} = 65.01$, SD = 41.52; $\beta = -9.96$, SE = 4.32, $t(812) = -2.31$, $p = .021; 95\%$ CI = [-18.44, -1.48]), and the Longest Anticipation-Lump Sum condition ($M_{LongestAnticipation-LumpSum} = 48.67$, SD = 44.10; $M_{ShortAnticipation-Continuous} = 65.01$, SD = 41.52; $\beta = -16.34$, SE = 4.28, $t(812) = -3.82$, $p < .001; 95\%$ CI = [-24.73, -7.94]; figure 13).
We conducted a similar regression predicting task enjoyment. Replicating studies 4-5, participants in the Short Anticipation-Continuous condition enjoyed the task significantly more than the No Anticipation condition ($M_{\text{No Anticipation}} = 4.10$, $SD = 2.00$; $M_{\text{Short Anticipation-Continuous}} = 4.54$, $SD = 2.00$; $\beta = -.45$, $SE = .20$, $t(812) = -2.25$, $p = .025$; $95\% \text{ CI} = [-.832, -.057]$), marginally more than the Longer Anticipation-Continuous Rewards condition ($M_{\text{Longer Anticipation-Continuous}} = 4.17$, $SD = 2.02$; $M_{\text{Short Anticipation-Continuous}} = 4.54$, $SD = 2.00$; $\beta = -.37$, $SE = .20$, $t(812) = -1.86$, $p = .063$; $95\% \text{ CI} = [-.766, .020]$), and significantly more than the Longest Anticipation-Lump Sum condition ($M_{\text{Longest Anticipation-Lump Sum}} = 3.94$, $SD = 1.99$; $M_{\text{Short Anticipation-Continuous}} = 4.54$, $SD = 2.00$; $\beta = -.60$, $SE = .20$, $t(812) = -3.04$, $p = .002$; $95\% \text{ CI} = [-.992, -.214]$).

Lastly, using the multicategorical Model 4 PROCESS macro (Hayes 2013), we found that task enjoyment significantly mediated the effect of total sets typed between the Longest Anticipation-Lump Sum and the Short Anticipation-Continuous conditions (index = -5.82, $SE = 1.93$, $95\% \text{ CI} = [-9.61, -2.11]$), indicating participants with a long (vs. short) period of reward anticipation enjoyed the task less ($B_{\text{indirect}} = -.60$, $SE = .20$, $95\% \text{ CI} = [-.992, -.214]$), and this
decreased enjoyment lead to decreased persistence ($B_{\text{indirect}} = 9.66$, $SE = .67$, 95% CI = [8.33, 10.99]).

Similarly, task enjoyment mediated the effect of Short (vs. No) Anticipation on persistence (index = -4.30, $SE = 1.91$, 95% CI = [-7.95, -0.53]), indicating participants with no anticipation of rewards enjoyed the task less than those with a short period of reward anticipation ($B_{\text{indirect}} = -.44$, $SE = .20$, 95% CI = [-.83, -.058]), and this decreased enjoyment lead to decreased persistence ($B_{\text{indirect}} = 9.66$, $SE = .67$, 95% CI = [8.33, 10.99]).

Discussion

This study replicated our main effect that consumers with a short period of reward anticipation persist more than those with a long period of reward anticipation and no anticipation. Further, it replicated our previous evidence for our proposed process: participants enjoyed the task more with a short period of reward anticipation than those with a long or no period of anticipation, increasing persistence. This study provides additional evidence of our theory, that it is the length of anticipation, and not the reward structure, that drives motivation. Those who received continuous rewards after a certain delay were differentially motivated as a function of the length of reward anticipation, rather than the size of the continuous reward.

Importantly, because we find that those in the Short Anticipation-Continuous condition persist longer than those in the Long Anticipation-Continuous Rewards condition, this study rules out several alternative explanations: 1) that these effects are driven by consumers setting a target goal, 2) that these effects are driven by larger continuous incentives, and 3) that these effects are driven by a preference for increasing sequences.
GENERAL DISCUSSION

Throughout six consequential studies involving real behavior, we examined how anticipation of rewards, and the length of anticipation, impacts reward enjoyment, task enjoyment, and persistence. We find that a short period of reward anticipation leads consumers to enjoy the task more, and thus persist more, than those with no or a long period of reward anticipation. Our studies reveal that consumers with no period of reward anticipation adapt to their reward over time, and those with a long period of reward anticipation adapt to the prospect of the reward over time, leading these consumers to enjoy completing the task less over time, ultimately decreasing task persistence. A short period of reward anticipation reduces anticipatory adaptation, and delays actual adaptation to the reward itself, increasing enjoyment of the task and persistence relative to no anticipation and a long period of reward anticipation.

Specifically, study 1 demonstrated that a short period of reward anticipation increases persistence compared with no period of reward anticipation in a longitudinal study examining a consequential health behavior, flossing. Study 2 provided initial evidence for the underlying process, revealing that a short period of reward anticipation delays the decline in task enjoyment over time relative to those with no period of reward anticipation, which increased persistence. Studies 3-4 replicated and extended these findings, comparing those with a short period of reward anticipation to those with a long and no period of reward anticipation. A long period of reward anticipation also reduced task enjoyment relative to those with a small period of reward anticipation, decreasing persistence as a result. Study 5 examined our proposed process, testing how different anticipation lengths affected actual and anticipatory enjoyment of rewards. This study revealed that consumers adapt to the prospect of the reward with a long period of reward anticipation, and adapt to the reward itself with no anticipation. Further, it demonstrated that
both anticipatory and actual reward enjoyment affect task enjoyment to increase persistence. Lastly, this study revealed that consumers with a short period of reward anticipation adapt less to the prospect of receiving the reward and adapt later to the reward itself, increasing persistence relative to those with a long period of reward anticipation and no reward anticipation. Lastly, study 6 found that motivation was driven by anticipation length, and not by reward structure.

Theoretical Contributions

This research contributes to several streams of literature. First, this research contributes to the literature on anticipation (Kasl, Gore, and Cobb 1975; Lowenstein and Elster 1992; Lowenstein 1987). While prior research has demonstrated that consumers can experience anticipatory enjoyment now while thinking about a future event, prior research did not examine how anticipatory enjoyment of a reward, and the length of anticipatory enjoyment, influence reward enjoyment, task enjoyment, and persistence. We demonstrate that anticipatory enjoyment of rewards is equal to if not greater than the enjoyment of receiving the reward itself. Second, we demonstrate how anticipatory enjoyment changes over time. We find that people can adapt to the prospect of a reward; thus, anticipatory enjoyment declines during initial stages of goal pursuit.

Second, this research contributes to the goal gradient hypothesis (Kivetz et al. 2006) by suggesting that there may not be a strict linear trend in consumers’ motivation to acquire a reward, similar to research on the “stuck in the middle” phenomena (Bonezzi et al. 2011). Our studies find that anticipatory enjoyment decreases in the beginning of goal pursuit. This decreased anticipatory enjoyment may lead to decreased motivation from the beginning to middle stages of goal pursuit when pursuing tasks with a long period of reward anticipation.
Third, it contributes to research on hedonic decline. While research has documented that consumers can experience hedonic decline for a variety of experiences (Galak and Redden 2018; Morewedge et al. 2010; Larson et al. 2014; Nelson and Meyvis 2008), prior research has not demonstrated whether consumers can adapt to money or rewards. We demonstrate that consumers enjoy receiving rewards less over time.

Fourth, this research contributes to the literature on affect transfer. Prior research has found that consumers’ enjoyment of achieving a goal, such as receiving a reward, can transfer over to the experience itself (Fishbach et al. 2004; Woolley and Fishbach 2018). We contribute to this research by suggesting that even anticipatory enjoyment of a reward can transfer over to and influence task enjoyment.

Fifth, our findings build on prior research on rewards. Prior research examining the impact of rewards on consumer behavior has primarily focused on how perceived effort influences motivation (Kivetz et al. 2006; Kivetz and Simonson, 2003; Nunes & Dreze 2006), the type of rewards that consumers prefer (Kivetz and Simonson 2002; Roehn, Pullins, and Rohem 2002), and how people focus on the reward medium over the outcome (Hsee et al. 2003). Further, prior research on operant conditioning has also examined various types of reward schedules, such as continuous reinforcement, where every behavior is rewarded, fixed ratio reinforcement, where behaviors are rewarded after a fixed number of behavior (e.g., rewarded one time after five behaviors, rewarded again one time after five behaviors), and fixed interval reinforcement, where behaviors are rewarded after a fixed amount of time has passed (e.g., rewarded one time after five minutes, rewarded again one time after five minutes). Lastly, some research has examined how reward and goal design influences consumers’ persistence and long-term habits (Beshears, Lee, Milkman, Mislavsky, and Wisdom 2019; Charness, & Gneezy 2009;
Sharif and Shu, 2017; 2019; DellaVigno and Pope 2017; Volpp et al. 2008; 2009). However, this past research did not examine how anticipation, or the length of anticipation, of rewards affects persistence. We contribute to this research in two ways: 1) by demonstrating that the amount of time that consumers anticipate their reward for has a greater influence on motivation and task enjoyment than the manner in which consumers receive their reward (e.g., more frequent smaller rewards vs. less frequent larger rewards). More importantly, we demonstrate why the amount of reward anticipation affects motivation. We provide empirical evidence of several novel processes: 1) consumers receive greater enjoyment from anticipating a reward than receiving a reward itself, 2) consumers adapt to rewards, 3) consumers adapt to the prospect of a reward.

Lastly, this research suggests a framework to unite previous research on savoring (Lowenstein and Elster 1992) and impatience (Thaler 1981), by suggesting that the length of anticipation will determine whether the experience of waiting will be relatively positive or negative. In doing so, it further contributes to previous research examining the benefits of waiting (Dai and Fishbach 2013; Koo and Fishbach 2010).

Future Research

This paper introduces several areas of open research. First, we demonstrate that anticipatory enjoyment decreases over time in the initial stages of goal pursuit. However, we did not examine how anticipatory enjoyment changes from the moment consumers first anticipate the reward to the moment they actually receive it. Does anticipatory enjoyment continue to decrease as consumers get very close to receiving the reward? Building off the goal gradient hypothesis and research on being “stuck in the middle” (Kivetz and Simonson 2003; Bonezzi, Brendl, and Angelis 2011), it’s possible that consumers’ anticipatory enjoyment is curvilinear.
Initially, consumers may have high anticipatory enjoyment; however, this anticipatory enjoyment slowly decreases over time; finally, right before receiving the reward, the anticipatory enjoyment may increase again. Future research should further examine the dynamics of anticipatory enjoyment across the entire length of goal pursuit.

Relatedly another open question pertains to why consumers’ anticipatory enjoyment declines over time in the first place. One explanation may relate to abstract versus concrete construal (Trope and Liberman 2003; Ulkumen and Cheema 2011). When consumers begin a task and anticipate a reward, they may focus on why the reward is important, generating more gratifying thoughts (i.e., an abstract construal); however, as they get closer to receiving the reward, they may have more concrete thoughts that are less gratifying, such as the feasibility and/or the work required to attain the reward (i.e., a concrete construal). Relatedly, consumers in the beginning of goal pursuit may assume a deliberative mindset, initially focusing on the desirability of the reward, and then later shift to an implemental mindset and focus on the effort required to attain the reward, decreasing excitement about the prospect of the reward over time (Gollwitzer 1990; Gollwitzer and Bayer 1999).

It is an open question if anticipatory enjoyment decreases for all positive experiences, or whether it is specific to the experience of receiving a reward for tasks that are less immediately gratifying (i.e., working and flossing). For example, it is possible that the observed effects are strongest when pairing a slightly negative experience, such as working out or studying vocabulary cards, with a positive experience, reward. If consumers are not required to engage in these less immediately gratifying behaviors, they may be less likely to adapt to the prospect of the reward. Future research should examine for which positive experiences consumers’ anticipatory enjoyment decreases over time.
Another open area of research pertains to consumers’ adaptation to rewards over time. Many factors can slow down hedonic decline, such as attention to the stimulus (Blass et al. 2006; Brunstrom and Mitchell 2006), complexity of stimuli (Berlyne 1971; Cox and Cox 2002), intensity of stimuli (Ghosal et al. 2014), and categorization of stimuli (Raghunathan and Irwin 2001; Redden 2008). Future research should examine whether these factors also reduce adaptation to a reward over time. For example, are consumers less likely to adapt to the reward if they receive different rewards for their actions (i.e., variety in rewards)? Further, given that adaptation is influenced by level of categorization, with broader categorizations facilitating adaptation, perhaps consumers also adapt to rewards at different rates depending on how they categorize their rewards.

Future research should also examine the optimal length of anticipation of rewards. Based on our studies, it appears that anticipating receiving a reward for 10-30% of a task is the most effective, and that anticipating 75% or more of a task is too long. Prior research should examine at what exact length anticipation of rewards becomes demotivating, or if it varies depending on the task. Finally, this research is limited in that we examined rewards of a small magnitude. While this is representative of the small rewards used in many types of marketing campaigns (e.g., loyalty points, credit card rewards, and sweepstakes offerings), future research should examine if consumers also adapt to larger rewards.

Marketing Implications

The findings of this research have clear implications for companies that aim to help consumers reach their long-term goals (e.g., fitness companies, weight loss companies, language learning companies). These companies have a difficult challenge in that they have to motivate
consumers to complete slightly unpleasant tasks (e.g., workout, study vocabulary cards, diet). Consumers may be demotivated to continue to adhere to the company’s program due to the unpleasant nature of the tasks, as well as to a lack of satisfaction in their progress towards their goals. The findings of this research can help solve both of these problems.

These companies should grant small rewards to consumers contingent upon their adherence to the program. In particular, they should provide rewards with a short period of reward anticipation. For example, returning to the opening example, CrossFit should not grant a reward to consumers for their first few sessions (e.g., five sessions), and then reward them for every session afterwards, for up to 30 sessions. Consumers are more likely to adhere to the program (i.e., increase consumer retention) when they have a short period of reward anticipation. Further as a result, they are more likely to make progress towards their long-term goals (e.g., become more fit, lose weight, learn a language), leading them to be more satisfied with their results. Greater customer satisfaction could lead to more loyal customers, as well as greater positive word-of-mouth about the company, increasing the likelihood that other consumers similarly join.

The findings of this research also have implications for sales. Prior research in the sales literature has primarily found mixed evidence of whether it is beneficial for a company to give quota-based rewards to their employees (Chung, Steenburgh, & Sudhir, 2013; Holstrom and Milgrom, 1987; Lal and Srinivasan, 1993; Oyer, 1998; Misra & Nair, 2011; Oyer, 2000; Raju & Srinivasan, 1996; Kim, 1997). This work primarily examined whether quota-based rewards are profitable for a firm’s bottom line in non-empirical settings. Our findings would suggest quota-based incentives would lead to greater motivation than continuous incentives if they have a relatively short period of anticipation.
Conclusion

This research demonstrates the impact of anticipation of rewards on reward enjoyment, task enjoyment, and persistence. As rewards are widely used in many consequential domains, further exploration into the role of anticipation in consumer rewards, as well as the resulting affective responses, is a ripe area for future research.
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