

Can't wait to pay:

The desire for goal closure increases impatience for costs

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<https://tinyurl.com/CantWaitToPayOSF>

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Abstract

We explore whether the desire to achieve psychological closure on a goal creates impatience. If so, people should choose an earlier (vs. later) option even when it does not deliver a reward. For example, they may prefer to pay money or complete work earlier rather than later. A choice to incur earlier costs seems to violate the preference for positive discounting (indeed, it may appear like *negative* time discounting), unless people value earlier goal closure. Across seven studies we consistently find that people preferred to pay more money sooner over less money later (Study 1) and complete more work sooner over less work later (Studies 2-5) more when they had a stronger desire for goal closure, such as when the sooner option allowed them to achieve goal closure and when the goal would otherwise linger on their minds (compared to when it would not). The implications of goal closure extend to impatience for gains (Studies 6-7), as people preferred less money sooner (vs. more later) when it allowed them to achieve goal closure. These findings suggest that the desire to achieve goal closure is an important aspect of time preferences. Taking this desire into account can explain marketplace anomalies and inform interventions to reduce impatience.

Keywords: patience, intertemporal choice, goal closure, time discounting

Open Science Framework: <https://tinyurl.com/CantWaitToPayOSF>

When people are impatient, they often opt for the smaller reward sooner over the larger reward later. One reason people make this choice is that they are viscerally tempted by the earlier reward, and so they discount the future “too much” (see Berns et al., 2007 for a review).

However, another reason why people prefer the earlier option may have nothing to do with the reward itself: This preference can reflect a desire to finish the transaction or, more broadly, to achieve *goal closure*. This paper argues that rather than reflecting a myopic desire for the reward, preferences for sooner options may be due to the desire for closure (Schumpe et al., 2017; Webster & Kruglanski, 1994).

This conjecture leads to a stark prediction in the case of costs: If people are truly impatient to achieve closure, they may prefer to incur a larger cost sooner over a smaller cost later when the former allows for goal closure. That is, people may be willing to incur a cost to achieve a goal sooner. Note that this preference to incur larger costs sooner would seem anomalous in the context of both standard and behavioral models of time discounting, as it would suggest that people have *negative* time discounting: They are willing to pay a premium to incur a cost sooner rather than later. In turn, examining whether the desire for goal closure affects the preference for larger-sooner costs is a strong test for this conjecture.

Impatience for Costs

People often prefer smaller rewards sooner instead of waiting for larger rewards later. This implies positive time discounting, where people place less weight on later outcomes than on sooner ones. Consistent with positive time discounting, people also prefer to pay more later instead of less sooner (i.e., discount future losses; Thaler, 1981). Similarly, procrastination is the preference to do more work later rather than less work sooner (Akerlof, 1991; O’Donoghue & Rabin, 1999; Zhang & Feng, 2020). Together, these patterns of choice suggest that the value of

both costs and benefits is smaller in the future than in the present. This implies that people should prefer to work or pay less later over more sooner.

Yet people occasionally prefer to incur larger costs sooner over smaller costs later, which if taken at face value, seemingly implies *negative* time discounting (Chapman, 1996; Hardisty et al., 2013; Sun et al., 2022). For example, people preferred a more painful medical treatment when it was available before a less painful medical treatment, even when the earlier treatment did not provide an earlier remedy (Roberts & Fishbach, 2020). This violates positive discounting because people are opting for a more negative outcome sooner rather than waiting for a less negative outcome later. As another illustration, in a pilot study ($n = 198$; see OSF for more details¹) we found that when obtaining a service, at least half of participants preferred to both receive \$1 less (86%) and to *pay* \$1 more (56%) to finish the transaction sooner rather than later. They wanted to finish the transaction sooner, even if it meant they would need to incur a cost.

To distinguish impatience from positive time discounting, throughout this paper, we define impatience as a preference for the sooner, inferior option, regardless of its valence. It includes the decision to select the sooner-smaller gain over the later-larger gain, or in the negative domain, to select the sooner-larger cost over the later-smaller cost.² While impatience has traditionally been studied as a preference for a smaller gain sooner, we focus instead on the preference to incur a larger cost sooner over a smaller cost later. People who choose to incur larger costs earlier, such as choosing to pay more money and do more work sooner, are said to be impatient.

¹ Link to OSF page: <https://tinyurl.com/CantWaitToPayOSF>

² Impatience in intertemporal choice is distinct from the negative feeling of impatience (Roberts & Fishbach, 2022). To be precise, impatience is the disproportionate preference for sooner-smaller gains and losses (i.e., it cannot be rationalized by a reasonable discount rate within the exponential discounting model). For example, preferring \$1 now to \$5 ten years from now is not impatience, as with inflation and interest rates, \$1 now is worth more than \$5 ten years from now.

We propose that rather than suggesting anomalous time discounting, people may display this preference because the sooner option generates the benefit of goal closure, and this benefit outweighs the negatives from earlier-larger costs (see Appendix A for the formal mathematical demonstration). By taking the desire for closure into account, this seemingly anomalous preference does not contradict positive time discounting.

Specifically, in the case of rewards, goal closure and positive time discounting predict the same directional effect: a preference for the smaller-sooner gain over a larger-later one. On the other hand, a preference for a larger-sooner cost cannot be explained by a myopic desire for the reward. Thus, it is a test of the unique value of goal closure. If people are willing to incur a larger cost to finish the transaction sooner, it suggests that they value achieving closure over saving their time or maximizing their monetary gains.

Desire for Closure and Impatience

The desire for closure is a motivational state characterized by an eagerness to finish a goal for the sake of finishing itself. People believe completing a goal is a gain and leaving a goal unresolved is a cost. Accordingly, goal fulfillment is satisfying (Gu et al., 2018) and associated with greater well-being (Emmons, 1986; Sirgy, 2021). Indeed, people value goal completion in and of itself. For example, people will choose a lower-reward task over a higher-reward task if it allows them to complete a goal (Converse et al., 2023). Additionally, people prefer almost-complete items over complete items because the anticipation of completion generates additional utility (Ruan et al., 2023). The mere act of finishing a goal generates utility on its own.

Further, leaving a goal unresolved is psychologically costly. Unresolved goals automatically attract attention (Moskovitz, 2002), which can harm performance (Lalot et al., 2022), cause intrusive thoughts during unrelated tasks (Masicampo & Baumeister, 2011), and

impair sleep quality (Syrek et al., 2017). According to the Zeigarnik effect (1938), people remember unfinished tasks better than finished ones, even when they do not plan to complete the task later (see also Mäntylä & Sgaramella, 1997; McGraw & Fiala, 1982; Patalano & Seifert, 1994; Seifert & Patalano, 1991). Thus, not finishing a task can be psychologically costly because people cannot get the unfinished task off their minds. The ability to finish a task and achieve closure provides utility beyond the options offered in the intertemporal choice, as it removes concerns about ruminating on the unfinished goal (Sun et al., 2015).

When people seek closure, they may prefer to conclude tasks rather than maximize monetary benefits. This can manifest in several ways that are not irrational but appear anomalous in the context of existing time preference models. People may be willing to pay or work more than necessary to achieve earlier goal closure. For example, a customer may tell a service provider (e.g., a waiter) to keep the change, leaving a larger cash tip than what is expected, because they do not want to wait for the change. They value finishing the transaction early more than getting their money back. Similarly, an employee might stay late to complete a work project before a vacation, even though the deadline is not until after they return to the office. Their eagerness to work reflects their desire to leave a clean desk before the vacation starts. Though it may seem anomalous to choose to pay a larger amount sooner or complete work sooner with no additional benefit, it does not imply negative time discounting if it comes with the benefit of earlier closure.

This idea has notable implications for how researchers think about impatience. Without considering the desire for closure, the preference to incur costs sooner seems as though people discount the *present* rather than the future, which contradicts the common understanding of how people perceive outcomes over time. However, the desire for closure can explain this otherwise

contradictory effect: People are willing to incur a cost sooner when it allows for earlier psychological closure on their goals.

Notably, while we propose that the desire for closure can explain the preference to incur costs sooner, it can also explain impatience to receive gains. We start with impatience to incur costs because it allows us to separate the myopic desire to receive a reward sooner from the psychology of seeking closure. That is, we explore whether people are willing to pay more (e.g., an extra \$1) or work harder (e.g., answering five extra questions) without any additional benefit when it allows them to achieve earlier closure. We next explore whether the desire for closure exacerbates impatience for gains as well.

Previous literature provides initial evidence for how seeking closure can generate impatience. Consider how borrowers choose to repay multiple debts. When people have multiple debts, the normative strategy is to repay the debt with the highest interest rate first. However, borrowers often prioritize paying off debts that they can fully resolve first (such as smaller debts), even when the interest rates on those debts are lower (Amar et al., 2011). That is, borrowers repay debt in the order that they can cover the balance, rather than focusing on repaying high-interest debt first. They are willing to incur a cost (by paying more in interest) to resolve a debt. While Amar et al. (2011) attribute their findings to “debt account aversion,” we predict that this behavioral pattern extends beyond just aversion to debt per se and varies with the desire for closure. Moreover, the desire for goal closure could also explain other instances of impatience to incur costs, such as the preference to work more sooner to finish a task.

Present Research

We predict that when people have a strong desire for goal closure, they will prefer the sooner option, even if they have to pay an additional cost. We identify two factors that influence

the desire for closure: *the ability to achieve closure* (e.g., the ability to finish a task versus just starting it) and *the value of closure* (e.g., the value of closure is higher when a work-related task is completed right before a vacation versus before another workday).

First, people seek closure on tasks that finish a goal (i.e., complete a gestalt; Koffka, 1935; Kohler, 1970). We accordingly predict that when facing an intertemporal choice, people will be more impatient to pay money or do work when it is the last step in finishing a goal rather than any earlier step in achieving a goal.

Indeed, research on the goal gradient effect documented that people work harder when closer to finishing a goal (Brown & Lahey, 2015; Hull, 1934; Kivetz et al., 2006; Koo & Fishbach, 2012; Wadhwa & Kim, 2015). They are more eager to complete the last step than any step before it. One reason for the increase in eagerness is that people seek closure more toward the end of the task. So, as they become closer to completing a task, their commitment to finishing increases (Bazerman et al., 1984; Brockner, 1992; Staw, 1981). We predict that people may further be more impatient to incur costs when it allows them to finish a goal.

For example, when close to finishing a task, people were willing to earn less money to finish the task before starting a new one (Jhang & Lynch, 2015). Presumably, the desire for goal closure increased closer to completing a goal, making people impatient. Beyond goal proximity and paying to eliminate an interruption, we predict that people will be willing to both pay a larger cost and earn less money sooner when it enables them to finish a focal task. Specifically, because completing the last step in a goal achieves goal closure, while completing an earlier step does not, the preference to work or pay more sooner (rather than less later) should be greater for the last step than an earlier one.

A desire for closure should similarly increase for tasks that are seen as part of an overall goal as opposed to as a separate goal. We accordingly predict that people will be more impatient (i.e., choosing to work more sooner) if the work is framed as completing the focal task rather than part of an additional, bonus task. Finishing an existing goal provides goal closure, while starting a new goal does not.

Second, the desire for goal closure increases when the value of closure is greater, such as when people expect that a task will be on their minds until it is complete. People seek closure when they worry about the mental cost of unresolved goals (Moskovitz, 2002; Masicampo & Baumeister, 2011; Sun et al., 2015; Syrek et al., 2017). Ironically, the fear of forgetting about a task may lead people to believe they will not be able to take it off their minds (i.e., think about it too much). For example, people may worry about having a task on their minds during an inconvenient time, such as thinking of a deadline at work on vacation. We predict that people will have a stronger desire for closure before going on vacation than before another workday.

We use these operationalizations of the desire for goal closure throughout our studies. That is, we measure impatience when the task allows for earlier goal closure because it completes a goal (Studies 1-4 and Study 7), compared to when it does not. We also measure impatience when there is concern about a task being on one's mind (Study 5), compared to when there is not. These factors should increase impatience because they increase the desire for closure. Thus, throughout our studies, we measure the desire for closure predicting it would mediate the effect of both the ability to finish a goal earlier and the value of finishing a goal on impatience (i.e., the decision to incur larger costs sooner vs. smaller costs later and the preference to receive smaller gains sooner vs. larger gains later).

There might be another reason why people prefer to schedule negative or costly events sooner: scheduling a negative event sooner reduces feelings of dread. Anticipating the future can create negative utility today (Loewenstein, 1987), which leads people to prefer to schedule negative events sooner (Harris, 2012; Mischel et al., 1969). For example, the dread from anticipating an electric shock led participants to prefer to receive a higher-voltage electric shock immediately instead of waiting to receive a lower-voltage electric shock later (Cook & Barnes, 1964; Berns et al., 2006; Sun et al., 2015).

Dread is the anticipatory disutility from a negative event. This is distinct from the disutility from the desire for goal closure, which comes from having an unfinished goal lingering on the mind. The desire for goal closure is thus not specific to negative events. To distinguish the desire for goal closure from dread, we test our hypotheses in contexts where choices prompt the desire for goal closure but do not generate dread, such as when waiting to receive a reward. Our manipulations also aim to influence goal closure without affecting dread. For example, the last task in a series should not elicit more dread than a bonus task, yet we predict that the last task elicits a greater desire for closure. We also measure feelings of dread to test it as an alternative explanation.

We further distinguish the desire for goal closure from uncertainty avoidance. Uncertainty, or risk aversion, can also explain why people sometimes prefer to schedule negative events sooner (Bixter & Luhmann, 2015; Halevy, 2008; Hardisty & Pfeffer, 2017; Walker et al., 2018). People may feel uncertain that they will complete a task if they delay it, as delaying the completion of a task increases the risk that it will not be completed at all. However, uncertainty aversion is distinct from the desire for goal closure. Even if people are certain that they will complete a goal, they may still dislike the experience of having the goal on their minds. To

account for uncertainty aversion, we manipulate the desire for goal closure in ways that do not affect uncertainty (e.g., paying for the last vs. first task) and measure participants' uncertainty that they will complete the task to test the motive as an alternative explanation.

We tested our predictions across seven studies ($N = 1,871$). We summarized the studies in Table 1. We also report four additional studies in the Supplemental Materials. These studies manipulated factors that increase the desire for goal closure and measured impatience. To maximize power, across these studies, we calibrated our measures and manipulations with pilot studies. These pilot studies yielded medium effect sizes on the main effect of the decision to work or pay more sooner (between $d = .41$ and $d = .69$). As a general rule, we targeted a minimum sample of 100 participants per cell. We exceeded this sample size only when pilot studies indicated that we needed a larger sample to achieve sufficient power. All sample sizes were determined prior to data collection. All studies reported received IRB review and approval. Full materials and data for all reported experiments and pilot studies are archived on OSF (<https://tinyurl.com/CantWaitToPayOSF>). We reported participant attrition in Appendix B (Zhou & Fishbach, 2016).

Table 1. Overview of studies.

Study	Closure Operationalization	Effect on Impatience
1	Service is the last (vs. first) in a sequence	Impatience for costs: Participants were more likely to pay the larger-sooner amount for the last (vs. first) service
2	Longer version of a task occurs sooner than the shorter version (vs. at the same time as the shorter version)	Impatience for work: Participants were more likely to complete a longer task when it occurred sooner than the shorter task (vs. when they occurred at the same time)
3	The task is the last (vs. first) in a sequence	Impatience for work: Participants were more likely to choose the longer-sooner version of the task for the last (vs. first) task The desire for closure mediated the effect on impatience
4	The task is framed as the last part of the main task (vs. a bonus task)	Impatience for work: Participants were more likely to choose the longer-sooner version of the task when it was framed as the last (vs. a bonus) task The desire for closure mediated the effect on impatience
5	A. The task is before a vacation (vs. before a workday) B. High (vs. low) ability for closure when completing the task	Impatience for work: Participants were more likely to complete work sooner without pay (vs. later with pay) before a vacation (vs. another workday) This effect was moderated when the ability for closure was low (vs. high) The desire for closure mediated the effect on impatience
6	--	Impatience for gains and costs: Participants' impatience for costs was positively correlated with their impatience for gains
7	The transaction has one payment (vs. multiple payments)	Impatience for gains and costs: Participants were more impatient to pay and receive money for a transaction with one payment (vs. multiple payments) The ability for closure mediated the effect on impatience

Study 1: Impatience to Pay to Finish a Service

We hypothesized that people are willing to pay a premium on a transaction when it allows them to achieve closure. Therefore, in the context of paying for a service, participants would prefer to pay more money now over less later (i.e., be more impatient to pay) when the payment is for the last (vs. first) service. Specifically, in Study 1, participants read that they were receiving services from several providers and made a choice about the payment for either the first service or the last service. We predicted that participants would be more willing to pay more

money sooner (vs. less later) for the last service than the first service, because the last service finishes the goal. We preregistered Study 1 at <https://aspredicted.org/6m9u6.pdf>.

Methods

Participants. We opened the survey to 200 participants from Amazon Mechanical Turk (MTurk) in exchange for \$0.45. MTurk returned 200 respondents. As preregistered, we analyzed responses only from participants who passed an attention check, resulting in a final sample of 194 participants (78 women; $M_{age} = 37.47$, $SD_{age} = 11.20$).

Procedure. We assigned participants to a 2-condition (start vs. finish) between-participants design. Participants read a scenario where they received services from several providers and chose how much and when to pay each provider. The description of the services was intentionally vague to avoid the irregularities of a specific context (i.e., we only specified that participants were “receiving services from many different people”), and could reflect a variety of situations, such as scheduling a dog walking service or a grocery delivery.

We manipulated how far participants were through receiving the services. In the start condition, participants read that they “had not started receiving any of the services yet” and decided on the payment for the first service. In the finish condition, participants read that they were “almost finished receiving all of the services” and decided on the payment for the last service. For either of these services, participants chose between paying \$11 now or \$10 in three months. Thus, participants chose between incurring a larger cost now versus a smaller cost later. We specified in both conditions that participants’ choice would not impact their payment for the other services.

Results and Discussion

In support of our hypothesis, more participants chose to pay \$11 now (vs. \$10 later) in the finish condition (51%) than in the start condition (36%), $\chi^2(1, N = 194) = 4.29, p = .038$. That is, participants were more impatient—choosing to pay more money sooner over less money later for a service—when it allowed them to finish their goal compared to when it did not. (Here and in several other studies, we also preregistered comparisons to 50%. These results are reported in the Supplemental Materials).

Whereas people are often impatient to receive money, in Study 1 we found they were also impatient to pay money. Participants were more impatient to pay for the last service compared to the first service. Despite that the appropriateness of delaying the payment and the cost of remembering to pay were the same for both the first service and the last service, participants were more impatient to pay for the last service. In the context of a one-time professional relationship, where there is no moral obligation or benefit to pay more than is owed earlier, people are willing to do so when it allows them to finish a goal.

Study 2: Impatience to Work to Finish a Task Sooner

Moving from impatience to pay to impatience to complete work, in Study 2 participants made a choice about an incentive-compatible work task. While people often procrastinate on their work, we tested whether they would prefer to work more sooner over less later when doing so enables earlier goal closure (vs. when it does not). Specifically, participants chose between a short and a long version of a password transcription task that offered the same payment. We predicted that participants would be more likely to choose to complete the longer version when it allowed them to finish the task sooner. We compared this condition to two conditions in which the long and the short versions were scheduled at the same time (either both were available

sooner or both were available later). These comparisons enabled us to test whether a desire for closure accounts for the preference for the longer-sooner task, rather than a possible inherent interest in completing longer tasks *per se*. Importantly, the sooner version occurred the next day (as opposed to immediately after making the choice). This ensured that the cost of reengagement was similar for both versions of the task, as participants always needed to remember to return to the study at a later date.

Methods

Participants. We opened the survey to 300 participants from the US on MTurk in exchange for \$0.30. Only participants who passed the comprehension checks could complete the entire study. MTurk returned 301 respondents who passed the comprehension checks (132 women; $M_{\text{age}} = 36.23$, $SD_{\text{age}} = 11.10$).

Procedure. We assigned participants to a 3-condition (longer version sooner vs. both versions sooner vs. both versions later) between-participants design. In the study, participants made a choice about a future task. The purpose of the task was to provide participants with a choice about an incentive-compatible work task that varied in length. Participants chose between transcribing either 20 or 17 ten-character alphanumeric passwords (e.g., 3atAmyNZ5P). In the longer-version-sooner condition, participants chose between transcribing 20 passwords the next day or 17 passwords in one month. In the both-sooner conditions, they chose between transcribing 17 and 20 passwords the next day, and in the both-later condition, they chose between transcribing 17 and 20 passwords in one month.

That is, in the longer-version-sooner condition, participants read, “You have the choice to complete [the task] tomorrow or to complete [the task] in one month ... If you choose to complete [the task] tomorrow, then you will need to enter 20 passwords. If you choose to

complete [the task] in one month, then you will only need to enter 17 passwords.” In the both-sooner and both-later conditions, participants instead read, “You will complete [the task] [tomorrow / in one month] ... you can choose to either enter 20 or 17 passwords when you complete [the task].”

Participants were informed that they would be paid the same amount (a \$1 bonus) in one month for transcribing the passwords regardless of their choice and had 24 hours to complete the task once it was available. As the primary dependent variable, participants made a binary choice to either transcribe a version of the task with 17 or 20 passwords. Participants were required to pass comprehension checks before making their choice, which tested that they understood how many passwords they would need to transcribe for each choice, their payment, and when they would receive the payment. If they failed the comprehension checks twice, they were dropped from the study.

After completing the study, participants were sent links to a survey to transcribe the passwords on the day that they selected. Participants were similarly likely to complete the task when it occurred the next day (56%) and in one month (51%), $X^2(1, N = 301) = 0.75, p = .386$, which suggests the cost of reengagement was similar for both options.

Results and Discussion

In support of our hypothesis, participants were more likely to choose the longer version of the task when it was scheduled before the shorter version (65%) than in the both-sooner (21%) and both-later (18%) conditions, $X^2(2, N = 301) = 61.56, p < .001$. Participants were more impatient to complete a longer version of a task when it occurred before the shorter version than when it occurred at the same time as the shorter version. (Notably, a nonnegligible minority

chose the costlier task when both tasks were at the same time, which suggests that some participants either did not pay attention or did not trust the instructions.)

In Study 2, participants were impatient to complete an incentive-compatible work task: They preferred to do more work when it allowed for earlier goal closure more than when it did not. As before, the potential to achieve goal closure led people to be more impatient to incur costs.

Study 3: Impatience to Work as a Function of Task Position

In Study 3 we presented an incentive-compatible work task as either first or last in a sequence. We predicted that participants would have a greater desire for closure, and hence be more impatient to complete work, when the task was last versus first. Specifically, using the same transcription task as in Study 2, we predicted participants would be more interested in completing a longer version of the task sooner if it was the last (vs. first) step they needed to complete. We also measured the desire for goal closure, predicting it would mediate the effect of position (first vs. last task) on impatience. We preregistered Study 3 at

<https://aspredicted.org/cv3ru.pdf>.

Methods

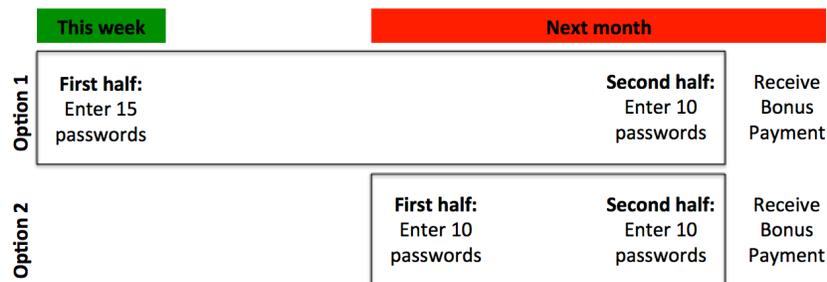
Participants. We opened the survey to 200 participants from the US on MTurk in exchange for \$0.40. Only participants who passed the comprehension checks could complete the entire study. MTurk returned 199 respondents who passed the comprehension checks (72 women; $M_{\text{age}} = 37.10$, $SD_{\text{age}} = 10.80$).

Procedure. We assigned participants to a 2-condition (start vs. finish) between-participants design. Participants read about the same password transcription task as in Study 2. However, in this study, the task had two parts. In one part, all participants would transcribe 10

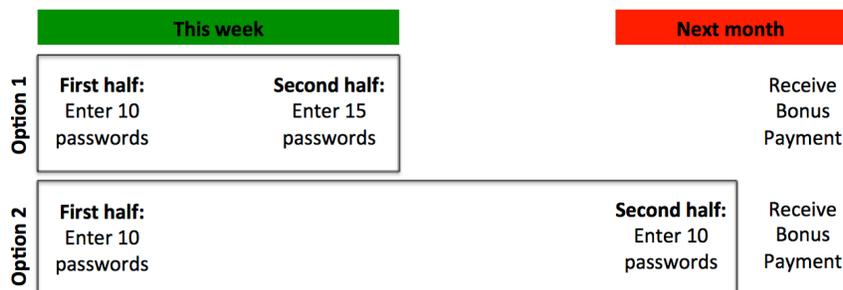
passwords. In another part, participants made a choice between transcribing 15 passwords that week or 10 passwords the next month. Thus, participants either transcribed a total of 20 or 25 passwords. We manipulated the order of the two parts (see Figure 1), so that the choice to transcribe 15 versus 10 passwords was either first (and started the experiment) or second (and finished the experiment). In the start condition, participants had a choice about whether to transcribe 15 passwords later that week or 10 passwords in one month. Either way, they would need to transcribe 10 passwords in one month and one day. In the finish condition, participants were told that they would transcribe 10 passwords the next day, and then had a choice about whether to transcribe 15 passwords later that week or 10 passwords in one month.

Figure 1. Timelines of the options in the start and finish conditions of Study 3.

Start condition:



Finish condition:



As before, participants learned they would receive their (fixed) payment after a month and one day, regardless of their choice. As the primary dependent variable, participants made a

binary choice to either transcribe 15 passwords later that week or 10 passwords in one month. Thus, participants chose between completing more work sooner or waiting to complete less work later for the same exact payment. Participants were required to pass comprehension checks before making their choice, which tested that they understood how many passwords they would need to transcribe for each choice, the payment, when they would receive the payment, and how long they had to complete the task. If they failed the comprehension checks twice, they were dropped from the study.

Next, to assess the desire for goal closure, participants rated the extent to which their decision was driven by (a) the desire to cross the tasks off their list of things to do, (b) the desire not to think about the tasks for a long time, (c) the desire not to leave the tasks unresolved, and (d) the desire to finish the tasks as soon as possible (1 = not at all; 7 = very much).³ These items averaged into a desire for goal closure index (4 items; $\alpha = .860$). Additionally, participants rated how likely they were to try to complete the entire task (1 = not at all; 7 = definitely). We neither predicted nor found an effect on this variable, which suggests that our findings were not driven by differences in the attractiveness of the task between conditions.

After completing the study, participants were sent links to a survey to transcribe the passwords on the day that they selected. Participants were similarly likely to complete the entire task regardless of whether they were in the finish condition (40%) or the start condition (33%), $X^2(1, N = 199) = 1.04, p = .307$, which suggests the cost of reengagement was similar for both conditions.

³ Given that the final measure in the desire for goal closure index (i.e., “the desire to finish the tasks as soon as possible”) could be considered similar to impatience, we replicated our analyses without the item. The desire for goal closure also mediates the effect of the ability to finish a goal on impatience to incur larger costs sooner in Studies 3 and 4 when excluding the final measure. We also included different process measures in Studies 5 and 7, which were theoretically distinct from impatience.

Results and Discussion

In support of our hypothesis, participants were more likely to choose to transcribe 15 passwords (i.e., more work sooner) when it determined when they finished the task (60%) than when it determined when they started the task (45%), $X^2(1, N = 199) = 4.10, p = .043$.⁴

Additionally, as predicted, participants had a greater desire for goal closure in the finish condition ($M = 4.37, SD = 2.02$) compared to the start condition ($M = 3.72, SD = 1.96$), $t(197) = 2.28, p = .024$. We further found that the desire for goal closure mediated the effect of task position (start vs. finish) on the decision to work more sooner (using Model 4 of SPSS Macro PROCESS with 10,000 samples; Hayes 2017), indirect effect = -1.15, $SE = 0.57$, 95% CI = [-2.39, -0.17].

Overall, participants were more impatient—choosing to complete more work sooner—when making a choice about a task that would conclude (vs. start) the experiment. Participants also had a greater desire for goal closure for the last task, which mediated the effect of the task position on impatience. Thus, people are more impatient to complete more work sooner when they have a stronger desire for goal closure, such as when their choice determines when they will finish a task.

Study 4: Impatience to Work as a Function of Task Framing

Beyond the position of a task, the framing of a task can also influence the desire for closure, which in turn decreases patience. If people think of an upcoming task as completing something that they have already started, then they will have high desire for closure and be impatient to complete it. Yet, if they instead think of the upcoming task as separate from previous work, they will be more patient to postpone doing it. We tested this prediction using a

⁴ Given the small effect size, we ran a replication of the study (in the Supplemental Materials on OSF), which again found a similar result, $X^2(1, N = 257) = 4.21, p = .040$.

novel task that involved writing product reviews. We predicted that after completing three product reviews, participants would prefer to write a longer review sooner (vs. a shorter review later) if doing so was framed as “finishing the task” as opposed to “completing a bonus task.”

We also measured the desire for goal closure, predicting it would be higher when the additional review was framed as finishing the task (vs. completing a bonus task), and would mediate the effect of the framing on choice.

Finally, we tested for several potential alternative explanations for our effect. In addition to the desire for goal closure, people may prefer to work more sooner to eliminate the dread of anticipating the upcoming task (Berns et al., 2006; Cook & Barnes, 1964; Harris, 2012; Loewenstein, 1987; Mischel et al., 1969; Sun et al., 2015). Additionally, people may wish to incur costs earlier as a pre-commitment device (Della Vigna & Malmendier, 2006; Thaler & Bernartzi, 2004; Trope & Fishbach, 2000; Wertenbroch, 1998). If people are concerned that their preferences will change over time, scheduling a costly event sooner is a way to pre-commit to completing a task. For example, students will set costly early deadlines for themselves to force themselves to complete their work (Ariely & Wertenbroch, 2002).

People may also prefer to schedule work sooner if they believe that they have more time available in the present than the future. If people know that they have free time now but are uncertain how much time they have in the future, choosing to complete work sooner might be a strategic way to manage their time. Typically, people believe they will have more time in the future because they are more aware of their present responsibilities than their future ones (Zauberman & Lynch, 2005). However, if people happen to have ample time or resources available in the present, they may prefer to incur costs or complete work earlier.

In Study 4 we tested for these alternative explanations by measuring participants' dread for the bonus task, desire for pre-commitment, and perceptions of available time. We did not predict that framing the fourth product review as the last task rather than a bonus task would influence these measures. We preregistered Study 4 at <https://aspredicted.org/7yu5g.pdf>.

Methods

Participants. We opened the survey to 200 participants from a university's online participant pool in exchange for a \$2 Amazon.com gift card. Only participants who passed the comprehension checks could complete the entire study. The participant pool returned 200 respondents who passed the comprehension checks (136 women; $M_{age} = 29.13$, $SD_{age} = 11.94$).

Procedure. We assigned participants to a 2-condition (last vs. bonus task) between-participants design. All participants reviewed three products: an instant pot, blue light glasses, and a heated mug. For each product, participants answered one open response question on their thoughts about the product as well as four multiple choice questions about their perceptions of the product. Participants were then presented with a choice to either answer ten questions when they completed the fourth product review the next day or five questions when they completed the fourth product review in two weeks (the questions were a combination of open-ended responses and multiple choice).

We manipulated the framing of the fourth product review. Participants in the last task condition read that they would review four products in the study. Participants in the bonus task condition instead read that they would review three products in the study. Therefore, after reviewing three products, participants in the last task condition were almost finished reviewing the products (and made a choice about when they wanted to review the last product), while participants in the bonus task condition read that they had finished reviewing the products (and

made a choice about when they wanted to review a bonus product). Participants learned they would receive the same payment for the fourth task after two weeks, regardless of their choice or condition. Thus, the only difference between conditions was in the framing of the fourth task. Participants were required to pass comprehension checks before making their choice, which tested that they understood how many questions they would need to answer for each choice, the payment amounts, when they would receive the payment, and how long they had to complete the task. Participants could only complete the study if they answered the comprehension checks correctly. If they failed the comprehension checks, they were prompted to answer again until they responded correctly.

To assess the desire for goal closure, participants then rated four items adapted from Study 3, including (a) the desire to cross reviewing the product off their list of things to do, (b) the desire to get the product reviews off of their mind, (c) comfort with leaving the product review unresolved (reverse-coded), and (d) the desire to finish reviewing the products as soon as possible (1 = not at all; 7 = very much). We averaged these measures into a desire for goal closure index (4 items; $\alpha = .817$).

Additionally, participants answered exploratory questions to assess their dread for the bonus task, desire for pre-commitment, and perceptions of available time. We presented these items in a counterbalanced order along with the desire for goal closure index. To measure dread for the bonus task, participants rated the extent to which they were dreading reviewing the product (1 = not at all; 7 = a lot). This item was adapted from Harris (2012). To measure their desire for pre-commitment, participants rated the extent to which their decision was driven by a desire (a) to commit to reviewing the product and (b) to review the product before their preferences changed (1 = not at all; 7 = very much). We averaged these measures into a desire

for pre-commitment index (2 items; $r = .345$). Finally, to measure perceptions of available time, participants rated whether they expected to have more free time in one day or two weeks (1 = much more time available in one day; 7 = much more time available in two weeks). This item was adapted from Zauberman and Lynch (2005).

After completing the study, participants were sent links to a survey to review the product on the day that they selected. Participants were similarly likely to complete the product review when it was framed as the last task (81%) compared to a bonus task (77%), $X^2(1, N = 200) = 0.48, p = .489$, which suggests the framing did not influence the likelihood of completing the fourth task.

Results and Discussion

In support of our hypothesis, participants were more likely to choose to complete the longer task sooner when it was presented as the last task (61%) compared to as a bonus task (39%), $X^2(1, N = 200) = 9.68, p = .002$. That is, participants were more impatient to complete work when it was framed as completing an existing goal rather than starting a new one.

Additionally, as predicted, participants felt a significantly greater desire for goal closure in the last task condition ($M = 5.22, SD = 1.52$) than in the bonus task condition ($M = 4.44, SD = 1.46$), $t(198) = 3.70, p < .001$. We further found that the desire for goal closure mediated the effect of the task framing (last vs. bonus) on the decision to work more sooner (using Model 4 of SPSS Macro PROCESS with 10,000 samples; Hayes, 2017), indirect effect = -0.64, $SE = 0.22$, 95% CI = [-1.14, -0.18].

As predicted, there were no significant differences in dread for the bonus task (last task: $M = 1.91, SD = 1.20$; bonus task: $M = 1.97, SD = 1.35$; $t(198) = 0.33, p = .740$), desire for pre-commitment (last task: $M = 3.56, SD = 1.65$; bonus task: $M = 3.48, SD = 1.56$; $t(198) = 0.33, p =$

.741), and perceptions of available time (last task: $M = 3.72$, $SD = 2.06$; bonus task: $M = 4.04$, $SD = 1.87$; $t(198) = 1.15$, $p = .251$). This suggests that greater impatience to complete the fourth task when it was framed as part of the main task was not due to differences in dread, the desire for pre-commitment, or perceptions of available time.

In Study 4, participants were more impatient to complete work when the task was presented as finishing a focal task rather than completing a bonus task, even though the only difference was in framing. These results provide further evidence that people are more impatient to work when they can achieve goal closure. Additionally, Study 4 tests several alternative explanations. We find that framing work as completing a focal rather than bonus task does not influence participants' dread, desire for pre-commitment, or perception of available time. Finally, these results suggest that framing a task as new or separate from previous work is a potential intervention to reduce impatience.

Study 5: Impatience Without the Ability for Closure

In Study 5, we explore a new operationalization of the desire for closure: wanting to get a work task off one's mind during an upcoming vacation. Before a vacation, people may have a strong desire to achieve closure on their work tasks. They may be willing to complete work sooner without pay (instead of postponing work for later, with pay) so that they do not need to think about the task on their vacation.

We further test whether this effect is attenuated when participants are less able to achieve closure. We predicted that when finishing a work task would not fully allow participants to achieve closure (a direct manipulation of goal closure), they would be less willing to stay late and finish the report without overtime. In particular, we predicted that reducing the ability to achieve closure would moderate the difference between impatience when the next day is a

vacation compared to a workday. In this study, we also measured participants' feelings of certainty that they would finish the report as a potential alternative explanation. We preregistered Study 5 at <https://aspredicted.org/pu73j.pdf>.

Methods

Participants. We opened the survey to 400 participants from the US on Prolific in exchange for \$1. Only participants who passed the comprehension checks could complete the entire study. Prolific returned 405 respondents who passed the comprehension checks. As preregistered, we analyzed responses only from participants who passed an additional attention check, resulting in a final sample of 392 participants (190 women; $M_{\text{age}} = 35.13$, $SD_{\text{age}} = 11.24$).

Procedure. We assigned participants to a 2 (Next Day: vacation vs. workday) \times 2 (Ability for Closure: high vs. low) mixed design, where the Next Day was within-participants and the Ability for Closure was between-participants. Participants read two scenarios in a counter-balanced order. In both scenarios, participants read:

“It is the end of the day, but you have one hour left of work on a report until you finish it. If you want to finish the report tonight, you will have to stay after work to finish the report. You won't be paid for the overtime. The report is not due for a few weeks, so you can wait to finish it later if you want.”

In the workday condition, participants then read that they will be in the office working tomorrow, so they can either stay late and finish the report tonight or finish the report tomorrow. In the vacation condition, participants instead read that they will be leaving for a holiday vacation tomorrow, so they can either stay late and finish the report tonight or finish the report after the vacation.

Additionally, in the low ability for closure condition, participants read that finishing the report would not allow them to achieve closure: “Finishing the report will not give you closure on your work. You have other ongoing projects at work and so finishing this one will not

give you a sense of closure.” Participants in the high ability for closure condition instead read that they can achieve closure: “Finishing the report will give you closure on your work.” Thus, for consistency, participants read about closure in both conditions.

To measure impatience to work, participants rated their preference to either wait to finish the report later or stay late and finish the work that day without overtime (1 = strongly prefer to wait to finish the report, 7 = strongly prefer to stay late and finish the prefer tonight). Thus, participants rated their preference to incur a larger cost (work without pay) sooner versus a smaller cost (work with pay) later. Participants were required to pass comprehension checks before selecting their preference, which tested that they understood when they would be able to finish the report, that they would not receive overtime for completing the report that day, and whether completing the report would provide closure. Participants could only complete the study if they answered the comprehension checks correctly. If they failed the comprehension checks, they were prompted to answer again until they responded correctly.

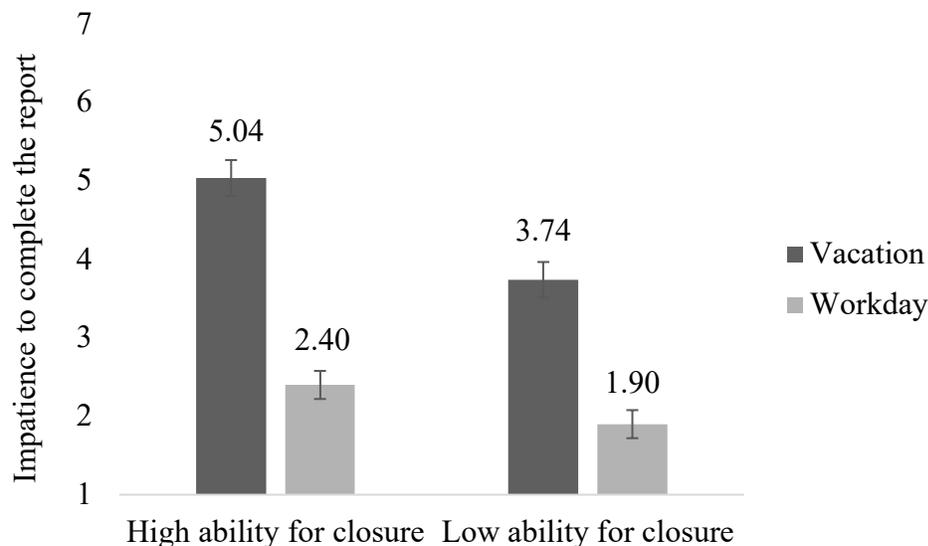
To assess the desire for goal closure, participants rated how much (a) they wanted closure on the report and (b) it would bother them to leave the report unresolved (1 = not at all; 7 = very much). We averaged these measures into a desire for goal closure index (2 items; $r_{vacation} = .785$; $r_{workday} = .652$). Finally, as an exploratory measure to assess a potential alternative explanation, participants rated how certain they were that they would complete the report (1 = not at all; 7 = very).

Results and Discussion

A mixed ANOVA on the preference for an impatient choice yielded a significant main effect of the Next Day, $F(1, 390) = 367.86, p < .001, \eta^2_p = .49$, where participants were more impatient to finish the report before a vacation than before another workday. We also found a

main effect of the Ability for Closure, $F(1, 390) = 27.01, p < .001, \eta^2_p = .07$, where participants were more impatient when they were more able to achieve closure. In support of the hypothesis, we found a significant Next Day \times Ability for Closure interaction, $F(1, 390) = 11.64, p < .001, \eta^2_p = .03$ (see Figure 2). In the high ability for closure condition, participants were more impatient to finish the report before a vacation compared to before another workday, $t(197) = 15.56, p < .001$. This effect was moderated when finishing the report would provide less goal closure, $t(193) = 11.48, p < .001$. Even with low ability to achieve goal closure, we found that participants were still significantly more impatient before a vacation compared to before a workday. This may be because participants still benefit from finishing the report before their vacation even if it does not give them complete closure on their work (e.g., they can cross one thing off their list). (We report the simple effects of the high ability for closure versus the low ability for closure conditions for each variable in the Supplemental Materials.)

Figure 2. The likelihood of finishing a work report earlier (outside of work) compared to waiting to finish the report during work hours (Study 5). Participants were more impatient to finish the report before a vacation compared to before another workday. This effect was attenuated when participants were less able to achieve closure when they finish the report.



In support of the mechanism, a mixed ANOVA on the desire for goal closure yielded a significant main effect of the Next Day, $F(1, 390) = 246.86, p < .001, \eta^2_p = .39$, where participants had a stronger desire for closure before a vacation than before another workday. We also found a main effect of the Ability for Closure, $F(1, 390) = 18.03, p < .001, \eta^2_p = .04$, where participants had a greater desire for closure when they were more able to achieve closure. In additional support of the mechanism, we found a significant Next Day \times Ability for Closure interaction, $F(1, 390) = 11.07, p < .001, \eta^2_p = .03$. In the high ability for closure condition, participants were more impatient to finish the report before a vacation ($M = 5.40, SD = 1.72$) compared to before another workday ($M = 4.05, SD = 1.68$), $t(197) = 13.46, p < .001$. The difference between the desire for closure before a vacation ($M = 4.50, SD = 1.77$) compared to before a workday ($M = 3.62, SD = 1.68$) was moderated when finishing the report would provide less goal closure, $t(193) = 8.76, p < .001$. We further found that the desire for goal closure mediated the effect of the next day (vacation vs. workday) on the decision to finish the report outside of work hours (using Model 1 of SPSS Macro MEMORE with 10,000 samples; Montoya & Hayes, 2017), both in the high ability for closure condition, indirect effect = -1.52, SE = 0.14, 95% CI = [-1.81, -1.25], and low ability for closure condition, indirect effect = -0.70, SE = 0.12, 95% CI = [-0.95, -0.48]. Using a multilevel moderated mediation analysis, we further found evidence for moderated mediation, where the effect was stronger in the high ability for closure condition than the low ability for closure condition, indirect effect = -0.46, 95% CI = [-0.95, -0.13].⁵

Additionally, a mixed ANOVA on certainty did not yield a significant main effect of the Next Day, $F(1, 390) = 0.35, p = .557, \eta^2_p = .00$, or the Ability for Closure, $F(1, 390) = 0.18, p =$

⁵ Note that this analysis was not preregistered and should thus be viewed as exploratory.

.670, $\eta^2_p = .00$, as predicted. There was a marginal Next Day \times Ability for Closure interaction, $F(1, 390) = 3.22, p = .074, \eta^2_p = .01$. In the high ability for closure condition, there was no difference in certainty that participants would finish the report before a vacation ($M = 5.98, SD = 1.31$) compared to before another workday ($M = 5.91, SD = 1.70$), $t(197) = 0.81, p = .422$. However, in the low ability for closure, participants were marginally more certain that they would finish the report before a workday ($M = 5.96, SD = 1.46$) compared to before a vacation ($M = 5.81, SD = 1.41$), $t(193) = 1.81, p = .073$. Uncertainty about finishing the report could not explain the effect on impatience.

In Study 5, we found that participants had a stronger desire for closure before a holiday vacation than before another workday. This led participants to be more likely to choose to stay after work to finish a report without overtime instead of waiting to finish it another day with pay. People are more impatient to incur costs when they have a stronger desire for goal closure because they are concerned that a task will be on their mind while on vacation.

This effect was moderated when participants learned that finishing the report would not allow them to achieve as much closure. Thus, Study 5 provides evidence for our proposed mechanism by directly manipulating the ability to achieve closure. Unable to achieve closure, participants were less interested in finishing work outside of working hours.

However, we find that even when we reduce the ability to achieve goal closure, participants were still significantly more impatient before a vacation compared to before a workday. This may be a limitation of our manipulation. We merely told participants that they could achieve less closure. Even though the manipulation was successful in shifting behavior on average, some participants in the low ability for closure condition may have still thought of ways

the smaller-sooner option could provide closure, at least partially. For example, they can cross one thing off their list before the vacation, even if they cannot achieve complete closure.

Study 6: Impatience to Receive and Pay Money

Studies 1-5 found that the desire for closure led people to incur a larger cost sooner (vs. smaller cost later). However, our model is not limited to costs. We predicted that those who have a stronger desire for closure would be impatient for gains as well as losses. Accordingly, in Study 6, we test the relationship between impatience for costs and impatience for gains, assuming both are a function of individual variations in the desire for closure. Using a standard intertemporal choice task (from Kirby et al., 1999), we measured both participants' impatience for gains (i.e., the decision to receive less money sooner instead of more later) and for costs (i.e., the decision to pay more money sooner instead of less later).

Both standard and behavioral models of time discounting predict a negative correlation between impatience to receive less money sooner (vs. more later) and impatience to pay more money sooner (vs. less later). That is, impatient people should choose to receive money sooner as well as postpone paying. Against this prediction, we proposed that a desire for closure would generate a positive correlation between the two preferences. That is, people who prefer to incur larger costs sooner are also more likely to choose smaller gains sooner.

Further, given positive time discounting, all people should prefer to pay less money later over more money sooner. Thus, without accounting for the desire for goal closure, any substantial choice of the costlier-sooner option (significantly greater than 0%) is a clear violation of the standard time discounting model. We preregistered Study 6 at

<https://aspredicted.org/s4pd6.pdf>.

Methods

Participants. We opened the survey to 200 participants from the US on Prolific in exchange for \$0.80. Prolific returned 210 respondents. As preregistered, we analyzed responses only from participants who passed the attention check and made consistent intertemporal choices, resulting in a final sample of 185 participants (95 women; $M_{\text{age}} = 38.91$, $SD_{\text{age}} = 12.80$).

Procedure. We assigned participants to a 2-condition (Choice: pay vs. receive) within-participants design. Participants made 28 intertemporal choices about receiving a smaller amount of money sooner (vs. larger amount later) and paying a larger amount of money sooner (vs. smaller amount later) to settle a debt in a counter-balanced order (adapted from Kirby et al., 1999). The choices in the pay and receive conditions were matched in the amounts and number of days until the later option. For example, in the receive condition, participants made a choice between receiving \$28 today or \$30 in 179 days. In the pay condition, participants instead made a choice between paying \$30 today or \$28 in 179 days.

One intertemporal choice was repeated twice to test for participants' attention. We excluded participants who answered the same questions differently each time it was presented in the study (i.e., they made inconsistent choices) as an additional attention check.

Results and Discussion

In support of the hypothesis, we found a positive correlation between impatience to pay more money sooner (vs. less money later; 45% of the choices) and impatience to receive less money sooner (vs. more money later; 50% of the choices), $r = .168$, $p = .022$. While the correlation is small, the direction of the effect is the opposite of any model of time preferences, including behavioral models, which would predict a strong *negative* correlation between the two behaviors.

To model potential variance across tasks, we also ran a linear mixed model, with choices to pay as the outcome, choices to receive as the fixed effect predictor, and participant ID and task number as cross-nested random effects. Choices to pay money were again positively associated with choices to receive money ($b = 0.20$, $SE = .01$, $p < .001$). Participants who were impatient to receive money were also more impatient to pay money.⁶

In Study 6, we find that impatience to receive money (less sooner instead of more later) is positively correlated with impatience to pay money (more sooner instead of less later). People who are impatient to get money tend to be also impatient to pay money, which suggests that these decisions are not necessarily driven by their financial needs (in which case the correlation would be negative) as much as by a desire for closure (hence, the correlation is positive).

Additionally, we find that participants opted to pay more money sooner instead of less money later in 45% of the choices. This is an extreme violation of standard and behavioral time discounting models. Given positive time discounting, all people should prefer to pay less money later over more money sooner. Only by taking the desire for closure into account does this seemingly anomalous preference no longer contradict positive time discounting.

Study 7: Impatience with Multiple Payments

In Study 6, impatience for gains was positively related to impatience for costs. In Study 7, we test whether the desire for closure can directly influence both. Specifically, we tested whether expecting to receive or pay additional amounts of money at future dates (beyond the intertemporal choice) would increase patience in an intertemporal choice, because the person can no longer achieve closure if they pay or receive the money sooner. For example, we expect a person facing the decision to pay \$30 now or \$28 later to become more patient if they also have

⁶ Note that this analysis was not preregistered and should thus be viewed as exploratory.

multiple payments scheduled in the future. Adding multiple payments eliminates the ability to achieve closure with the sooner option, and thus, should increase patience to both receive and pay money.

We also measured participants' feelings of dread about the upcoming payments or rewards to explore this alternative explanation. We preregistered Study 7 at <https://aspredicted.org/ai6dy.pdf>.

Methods

Participants. We opened the survey to 400 participants from the US on Prolific in exchange for \$0.55. Prolific returned 419 respondents. As preregistered, we analyzed responses only from participants who passed an attention check, resulting in a final sample of 400 participants (194 women; $M_{\text{age}} = 38.53$, $SD_{\text{age}} = 12.22$).

Procedure. We assigned participants to a 2 (Choice: pay vs. receive) \times 2 (Payments: one vs. multiple) between-participants design. Participants made seven intertemporal choices about either receiving a smaller amount of money sooner (vs. larger amount later) or paying a larger amount of money sooner (vs. smaller amount later), as in Study 6. In the multiple payments condition, participants read that they would also receive or pay four other amounts at later date. The amounts were the same for both the sooner and later intertemporal choice options; in turn, participants' choice would not influence these payments.

For example, in the one payment condition, participants made a choice between receiving \$28 today or \$30 in 179 days. In the multiple payments condition, participants instead made a choice between receiving \$28 today and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days or receiving \$30 in 179 days and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days (see Table 2). Note that the monetary options that differed between the

choices (\$28 today versus \$30 in 179 days) were the same in both conditions; the multiple payments conditions just included additional payments (\$18, \$77, \$35, and \$17) that were identical across the choices. The amounts for the four other payments were randomly selected, but the days were always 1.5, 2, 2.5, and 3 times the later date.

Table 2. Example intertemporal choices in Study 7.

	One-Payment	Multiple-Payments
Pay	Choose between: A. Pay \$30 today B. Pay \$28 in 179 days	Choose between: A. Pay \$30 today and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days B. Pay \$28 in 179 days and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days
Receive	Choose between: A. Receive \$28 today B. Receive \$30 in 179 days	Choose between: A. Receive \$28 today and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days B. Receive \$30 in 179 days and \$18 in 269 days, \$77 in 358 days, \$35 in 448 days, and \$17 in 537 days

The primary dependent variable was the percentage of sooner, or more impatient, choices. To assess the ability to achieve goal closure, participants rated how much they were able to achieve closure if they [pay / receive] the money today in the intertemporal choices (1 = not at all; 7 = very much). As an exploratory measure of dread, participants reported their anticipated feelings while waiting to [pay / receive] the money (1 = very unpleasant, 7 = very pleasant; reverse-coded; from Sun et al., 2022).

Results and Discussion

Descriptive statistics are reported in Table 3. In support of the hypothesis, a two-way ANOVA on the percent of impatient choices yielded a significant main effect of the Payment manipulation, $F(1, 396) = 5.60, p = .018, \eta^2_p = .01$, where participants were more impatient in the one payment condition than in the multiple payments condition where they could not achieve closure. The difference between the one payment condition and the multiple payment condition was marginally significant both when paying money, $t(200) = 1.70, p = .091$, and receiving

money, $t(196) = 1.77, p = .078$. There was also a significant main effect of the type of Choice, $F(1, 396) = 173.63, p < .001, \eta^2_p = .31$, where participants were more impatient to receive money than to pay money. The Payment \times Choice interaction on impatience was not significant, $F(1, 396) = 0.25, p = .615, \eta^2_p = .00$.

Table 3. Study 7 descriptive statistics (SDs in parentheses).

	One-Payment	Multiple-Payments
Percent of impatient choices		
Pay	45.92% (0.43)	35.44% (0.45)
Receive	92.22% (0.24)	85.40% (0.30)
Ability to achieve closure		
Pay	5.48 (1.92)	3.39 (2.00)
Receive	6.30 (1.47)	5.26 (1.51)
Dread		
Pay	4.38 (1.52)	4.70 (1.25)
Receive	3.97 (1.69)	3.69 (1.28)

In support of the mechanism, a two-way ANOVA on the ability to achieve closure yielded a significant main effect of the Payment manipulation, $F(1, 396) = 79.91, p < .001, \eta^2_p = .17$. In both the pay condition, $t(200) = 7.55, p < .001$, and the receive condition, $t(196) = 4.89, p < .001$, participants were able to achieve closure more in the one-payment condition than in the multiple-payments condition. There was also a significant main effect of the type of Choice, $F(1, 396) = 58.65, p < .001, \eta^2_p = .13$, where participants were able to achieve closure more in the receive condition than in the pay condition. We also find a significant Payment \times Choice interaction on the ability to achieve closure, $F(1, 396) = 8.92, p = .003, \eta^2_p = .02$, where the effect of the multiple payments was stronger when making choices about paying money compared to receiving money.

We further found that the ability to achieve goal closure mediated the effect of the Payments (one vs. multiple) on impatient decision-making (using Model 4 of SPSS Macro PROCESS with 10,000 samples; Hayes, 2017), indirect effect = -0.22, SE = 0.03, 95% CI =

[-0.29, -0.16]. Participants were more impatient to both pay money and receive money when they were able to achieve goal closure.

Additionally, a two-way ANOVA on feelings of dread yielded a significant main effect of the type of Choice, $F(1, 396) = 23.74, p < .001, \eta^2_p = .06$, where participants dreaded paying money more than receiving money. As predicted, the main effect of the Payment manipulation was not significant, $F(1, 396) = 0.02, p = .888, \eta^2_p = .00$. There was an unexpected significant Payment \times Choice interaction on feelings of dread, $F(1, 396) = 4.36, p = .037, \eta^2_p = .01$. When making choices about receiving money, there was no significant difference in dread between the one-payment and multiple-payments conditions, $t(196) = 1.31, p = .192$. However, when making choices about paying money, participants dreaded the payment marginally more in the multiple-payments condition than the one-payment condition, $t(200) = 1.66, p = .098$. This marginal effect on dread goes in the opposite direction as the effect on impatience: Participants dreaded the payment marginally more in the multiple-payments condition (vs. the one-payment condition), despite making less impatient intertemporal choices in the multiple-payments condition. This suggests that feelings of dread cannot explain the results in Study 7.

In Study 7, we find that eliminating the ability to achieve closure by having additional payments or rewards in the future reduces impatience to pay and receive money in intertemporal choice. People are more willing to both pay more money *and* receive less money sooner when the sooner option allows for goal closure compared to when it does not. The ability to achieve goal closure not only leads to impatience to incur larger costs sooner, but also to receive smaller gains sooner.

General Discussion

One reason people are impatient is that they seek closure on their goals. That is, people prefer to pay and work sooner more when they seek closure, such as when completing a task allows them to finish a goal (i.e., close a gestalt) or when they believe a task will linger on their mind until it is complete. Importantly, in addition to impatience for gains, the desire for goal closure can explain impatience to incur costs (i.e., preferring sooner-larger over later-smaller costs), which otherwise appears as discounting the *present* rather than the future.

While impatience for gains is more common, impatience to incur larger costs sooner (vs. smaller costs later) has been observed at times (Chapman, 1996; Hardisty et al., 2013). Our studies offer a novel explanation for both: the desire for closure. In seven studies (and four supplemental studies), we extend previous findings on impatience to incur costs by exploring the situations that increase the desire for goal closure. Indeed, while previous research has focused on impatience for costs in specific domains, such as healthcare (Roberts & Fishbach, 2020) and debt (Amar et al., 2011), we find that people have a more general aversion to leaving accounts unresolved, which extends to financial payments, projects at work, and experimental tasks. We provide a broader framework that can explain the effects in these studies, which have thus far been treated as separate phenomena. We also find that people are willing to pay a premium to complete a goal sooner, even without an interruption (Jhang & Lynch, 2014), such as when paying for the last (vs. first) service. Thus, in addition to providing a new theory for why people make impatient choices, our findings extend previous research by documenting additional consequences of the desire for goal closure and situations when people are impatient for costs.

While the desire for closure can explain why people might make an impatient choice (other than myopia), goal closure is not specific to intertemporal tradeoffs. Indeed, one reason

why people may work harder when closer to finishing a goal (i.e., the goal gradient effect) is because they have a stronger desire for goal closure (Brown & Lahey, 2015; Hull, 1934; Kivetz et al., 2006; Koo & Fishbach, 2012; Wadhwa & Kim, 2015). Yet, the desire for closure has a unique effect on the preference for earlier costs (or the choice to work more sooner instead of less later), which is a substantially different construct from general motivation.

Indeed, when people seek closure, they complete more work or pay a larger cost sooner, even when it does not lead to a better outcome and does not reflect greater motivation. For example, in an intertemporal choice, more motivated people might choose to patiently wait for more money, while people with a stronger desire for goal closure would choose to receive less money sooner to finish the task. They are willing to earn less money to finish the task sooner. Similarly, a person motivated to use their time wisely would choose to complete less work for the exact same pay, while an impatient person seeking goal closure would instead choose to work more sooner. People are willing to settle for less when they seek earlier goal closure. Indeed, in Study 6 we find that impatience for costs is correlated with impatience for gains, which suggests that impatient people who choose not to wait for more money also tend to choose to pay more sooner.

Our findings suggest potential interventions to improve patience by addressing the desire for goal closure. For example, allowing people to feel like they can achieve closure when they wait for the delayed option may lead to more patient decisions. Indeed, in Study 7, we find that the desire for goal closure also leads to impatience for gains, where people prefer to receive a smaller amount of money sooner (vs. larger amount later) when they have a stronger desire for goal closure. In the context of financial decision-making, guaranteeing payment in advance, such as an automatic payment that is scheduled in the present while the money will transfer in the

future, may increase patience, as it allows people to feel like they have already achieved closure before the payment arrives. Additionally, framing a task as new (rather than part of an existing goal) can increase patience, as the desire for goal closure is lower for new goals than for goals that people already started. These interventions tackle the desire for goal closure to encourage patient decision-making.

Alternative explanations

Previous research documented several other factors that increase the desire to schedule more costly or negative events sooner, including dread for an upcoming event (Cook & Barnes, 1964; Berns et al., 2006; Harris, 2012; Loewenstein, 1987; Mischel et al., 1969; Sun et al., 2015), perceptions of available time (Zauberman & Lynch, 2005), uncertainty avoidance (Bixter & Luhmann, 2015; Halevy, 2008; Hardisty & Pfeffer, 2017; Walker et al., 2018), and a desire to pre-commit (Ariely & Wertenbroch, 2002; Della Vigna & Malmendier, 2006; Thaler & Bernartzi, 2004; Trope & Fishbach, 2000; Wertenbroch, 1998).

We tested for these factors and found a unique effect of the desire for goal closure. Thus, we add to the literature on scheduling costlier events sooner while documenting the distinct effect of a desire for goal closure. Additionally, according to construal level theory people are more concerned with feasibility for immediate outcomes and desirability for later outcomes (Liberman & Trope, 2003). Thus, construal level theory cannot explain the choice to do more work sooner, as people are more aware of feasibility constraints in the near future. Indeed, the many factors that can explain impatience for gains (e.g., construal level theory, distance to the future self) cannot account for the preference to incur larger costs sooner.

The desire for goal closure is also more than the burden of needing to remember to complete a task. The mental cost of having to remember an upcoming task can increase the

desire for goal closure and therefore, impatience in intertemporal choice, such as in Study 5. However, achieving goal closure provides utility beyond eliminating the need to remember a task. First, there are costs associated with lack of closure, including the cognitive cost of remembering and the anxiety about not being able to forget. For example, people on a vacation may worry that they will forget to complete an unfinished work task or instead that they will not be able to get this task off their mind during the vacation. Second, there are benefits to achieving closure. Completing a goal provides positive feelings and creates value in and of itself (Converse et al., 2023; Gu et al., 2018; Ruan et al., 2023). Indeed, we find that participants have a stronger desire for closure, and thus are more impatient, for the exact same task when it is presented as the last task in a goal compared to a bonus task (in Study 4). Even when the need to remember a task is held constant, people have a stronger desire for closure for the final task in a sequence.

Another alternative is based on fixed-cost present bias. According to the theory of fixed-cost present bias, people have a fixed cost of doing something later versus sooner (of around \$4 for gains), regardless of the size of the outcome under consideration or its valence (Benhabib et al., 2010). Fixed-cost present bias for losses stems from “people want(ing) to get the loss over with immediately to close their mental books on the loss and avoid having to allocate attention and emotional capacity (e.g., dread) to looming future losses” (Hardisty et al., 2013). While there are psychological factors (e.g., dread, attention) that may make people impatient for losses, the exact theoretical construct that can generate fixed-cost present bias is unclear. Our model specifies the desire for closure as an important theoretical construct that generates impatience for losses and might underlie the fixed-cost present bias. Our model also allows us to make predictions beyond the fixed-cost present bias effect. For example, our model predicts that people will be impatient for both gains and losses in situations where one is close to finishing a

goal, when the goal will be on one's mind more, or when the outcome allows for goal closure more generally. These predictions would not follow from other potential psychological mechanisms included under the umbrella of fixed-cost present bias.

Implications

The desire for goal closure can help to explain a variety of previously documented effects. When people desire closure, completing goals is a gain while leaving goals unresolved is costly. This can help to explain debt aversion, which is the subjective cost that borrowers suffer when taking on a debt (Caetano et al., 2011; Callendar & Jackson, 2005; Eckel et al., 2007; Meissner, 2016). Indeed, the burden of carrying debt can reduce people's overall subjective well-being (Brown et al., 2005; Greenberg & Mogilner, 2020). One reason why people may be averse to accruing debt is because of the mental cost of leaving debt unresolved. People may dislike having an unfinished goal, like a debt to repay, on their minds. The inability to achieve closure on the debt may increase the subjective cost of borrowing money. Similarly, people might be averse to taking on multiple tasks at work because they anticipate feeling impatient to finish each one. Thus, framing multiple tasks as different aspects of the same goal may be beneficial as it allows people to only regulate their impatience toward one goal.

People may also find it more motivating to complete smaller goals first because it allows them to achieve closure. Prioritizing easier tasks first allows people to quickly achieve a sense of closure, which may motivate them to take on the next goal, even if it is harder. Indeed, personal financial guru Dave Ramsey advocates for a "snowball method" of debt repayment, where borrowers repay smaller debts first "in order to stay pumped enough to get out of debt completely" (Ramsey, 2009). While this can be motivating, it can also lead people to prioritize less important tasks that they are able to finish over more important tasks. Indeed, borrowers

repay their debts based on whether they can close the account instead of based on the cost of carrying the debt (Amar et al., 2011). They repay debt in the order that they can cover the balance, rather than prioritizing repaying high interest debt. Thus, borrowers are impatient to resolve their debts when it allows them to achieve closure. People may also be more likely to work on easier to accomplish but less important goals first (Zhu et al., 2018), because it enables them to achieve goal closure sooner.

When people have a strong desire for closure, rather than procrastinate, they prefer to complete their work sooner. Consequently, increasing the desire to achieve goal closure may help to reduce procrastination by accentuating people's impatience to finish a task. People may be able to increase their motivation to finish a goal by framing a task as the last step before achieving a goal or reminding themselves how much the goal will be on their mind until they finish, thereby increasing their desire for goal closure. This may lead an individual who otherwise prefers to delay working on their goal (e.g., completing a homework assignment or a fitness regimen) to instead try to complete the task sooner in order to achieve closure. For example, after finishing a history assignment, a student may be more motivated to finish a math assignment immediately when it is framed as the last subject of the night versus the first math assignment. Alternatively, the desire for goal closure may increase procrastination when people have multiple tasks, as they may prioritize less important but easy to finish tasks over more important larger ones. Considering the desire for goal closure can provide insight into interventions for reducing procrastination.

This suggests that in some cases, the desire to incur earlier costs may not be suboptimal. While impatience for costs is often suboptimal because people are paying and working more than necessary for the same outcome, there are certainly situations where choosing sooner costs may

be a better choice. For example, achieving earlier closure may be worth an additional cost if it allows people to take the task off their minds and work on other, more important things.

Additionally, increasing the desire for goal closure may help people to avoid procrastinating and allow them to dedicate more time to a task. Importantly, this suggests that choices that have thus far been interpreted as suboptimal (e.g., myopic) may actually increase welfare if they allow a person to achieve goal closure.

Limitations and Boundary Conditions

We find that participants are impatient to pay an additional \$1, answer an additional five questions, or transcribe up to five additional password tasks when they seek closure. However, we do not expect that people would be willing to incur any cost to achieve closure sooner. These effects are likely more prominent for relatively smaller costs (Hardisty et al., 2013). People will only be impatient to incur a cost when the benefit of achieving earlier goal closure outweighs the additional cost of selecting the smaller-later option. Thus, depending on people's desire for goal closure, they may be willing to trade off more or less money to achieve it. For example, there is substantial variation in how much people are willing to pay for a product to arrive faster: those who need it now may pay quite a bit, others who are relatively indifferent may not be willing to pay much at all. In the context of our model, for some people the benefits of goal closure may be smaller than the discount rate for rewards, while for others it may be higher. The fact that a substantial proportion of people are willing to incur sooner-larger costs over later-smaller costs—an extreme violation of the standard time discounting model—suggests that the benefits of goal closure are likely significant. However, if the ability to achieve goal closure requires a very large cost, such as paying hundreds of additional dollars or completing hours of extra work, many people may not choose to incur such a large cost to achieve closure.

Individual differences in the need for cognitive closure may also moderate our effect.

While the desire for goal closure is similar to the need for cognitive closure, the two concepts are theoretically distinct. The need for cognitive closure is the desire to find an answer on a topic rather than experience confusion or ambiguity when forming attitudes (Webster & Kruglanski, 1994). The desire for goal closure instead arises from the satisfaction achieved from completing a goal and the mental cost from leaving the goal unresolved. However, because both concepts relate to the desire to achieve a definite conclusion, individuals with a high need for cognitive closure may be more impatient to incur costs sooner than individuals with low need for cognitive closure. Indeed, individuals with a high dispositional need for cognitive closure were more impatient in a delay discounting task, preferring smaller but more certain monetary options (Schumpe et al., 2017). Future research could explore the extent to which impatient decision-making varies based on individual differences in the need for cognitive closure.

Finally, we find that people have a stronger desire for goal closure when they can complete a goal compared to when they cannot. However, there are many goals where people may not experience a strong desire for goal closure. For example, if the task is so large that people do not anticipate finishing anytime soon (e.g., repaying a mortgage on a house), then people may not seek closure. Additional research is needed to continue to explore the situations that evoke a strong desire for goal closure, and subsequently, impatience.

Appendix

Appendix A. Formal demonstration.

Below we outline our main hypothesis in a basic model of time preferences. In the model, a person chooses to allocate tasks, x_t , between work periods which can occur in $t = 0, 1$. Let $D(t)$ represent the person's discounting function. We assume that the tasks are not enjoyable to perform and that completing more tasks leads to lower utility, such that $u(x_t) < 0$ and $u'(x_t) < 0$ for any $x_t > 0$. Normalizing the instantaneous disutility of effort function $u(0) = 0$ and the discounting function $D(0) = 1$, the person in our studies solves the following choice problem:

$$\max_{x_0, x_1} U_0(x_0, x_1) = u(x_0) + D(1)u(x_1) \quad \text{s.t. } x_0 + \frac{x_1}{1+r} = I$$

where r is the interest rate by which tasks avoided in the earlier period grow and I is some positive constant representing the "budget" of total tasks that need to be done. In this basic setup, positive time discounting, $D(1) \in (0, 1)$, implies that there exists an interest rate $r \geq 0$ such that the person will prefer to allocate more tasks to the future than to the present. Moreover, if the interest rate is zero, the person will strictly prefer to allocate the work tasks to the later period.

To formally illustrate the intuition for our hypothesis, consider a choice between options where Option 1 has $x_0 > x_1$ and Option 2 has $x_0 < x_1$. It is straightforward to show that a choice of Option 2 implies positive time discounting while a choice of Option 1 implies negative discounting, i.e., $D(1) > 1$.

The results from our studies imply that people may indeed prefer Option 1 to Option 2.⁷ One interpretation is that people place more weight on the future than the present. However, this interpretation would run counter to much of the evidence we have from psychology and behavioral economics. Another interpretation is that the above formulation of the choice problem

⁷ In the case of Studies 1, 6, and 7, the disutility from effort is replaced with the disutility of payment.

is mis-specified, leaving out an important aspect of a person's decision-making process. In our studies, we find that people prefer Option 1 to Option 2 only when the former allows for goal completion. To incorporate this into the model, amend the choice problem to be:

$$\max_{x_0, x_1} U_0(x_0, x_1) = u(x_0 + G) + D(1)u(x_1) \quad \text{s.t. } x_0 + \frac{x_1}{1+r} = I$$

where $G \in \{0, g\}$ is the goal completion premium, which is equal to $g > 0$ if completing the tasks earlier leads to goal closure, and zero otherwise. It is now straightforward to show that if the goal completion premium g is large enough, a person with positive time discounting $D(1) \in (0,1)$ will prefer Option 1 over Option 2 if this choice will lead to goal closure. If Option 1 does not allow for goal closure, this individual will switch to preferring Option 2.

This pattern is consistent with the findings in our studies, which suggests that, rather than exhibiting negative time discounting, people put a significant premium on goal closure.

Appendix B. Participant attrition for Studies 1-7.

Condition	Dropouts	Percentage
Study 1		
Start	2	0.95%
Finish	0	0.00%
Study 2		
Longer task sooner	31	6.72%
Both-sooner	41	8.89%
Both-later	27	5.86%
Study 3		
Start	30	9.80%
Finish	21	6.86%
Study 4		
Final task	2	0.98%
Bonus task	2	0.98%
Study 5		
Ability for closure	1	0.24%
No ability for closure	3	0.73%
Study 6		
All participants	2	0.94%
Study 7		
Pay one payment	1	0.24%
Pay multiple payments	0	0.00%
Receive one payment	0	0.00%
Receive multiple payments	1	0.24%

Note. Dropouts were not counted toward reported sample sizes.

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