

THE UNIVERSITY OF CHICAGO

WHAT ARE YOU WAITING FOR?

FACTORS THAT INFLUENCE PATIENT DECISIONS AND EXPERIENCES

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## Overview

In my dissertation research, I explore the psychology of patience. Patience has primarily been studied as a choice. When people are patient, they are willing to wait to receive a better outcome later instead of a worse outcome sooner. The decision to wait predicts better outcomes in a variety of domains, from health to financial decision-making (Hershfield et al., 2011; Malkoc & Zauberman, 2019; Moffitt et al., 2011; Schlam et al., 2013; Urminsky & Zauberman, 2017). However, there are many situations where people are not given a choice about whether to wait. In these situations, patience is an experience (Barragan-Jason et al., 2018; Schnitker, 2012). Patient people are able to wait without suffering.

My dissertation explores patience as both a decision and an experience. In doing so, I am able to identify new factors that influence patience, such as liking for the reward (Chapter 1) and the desire for goal closure (Chapter 2), as well as understand the relationship between the two definitions of patience (Chapter 3). These findings not only provide insight into interventions to effectively improve patient decision-making, but also help to shed light on what it means to be patient.

In Chapter 1, I examine how liking a target influences patience. Even though people find it harder to wait for a target when they like it a lot (vs. a little), I find that they are more likely to choose to do so. This is because when people like a target more, they perceive a greater difference in subjective value between its smaller-sooner and larger-later versions. These findings suggest that patience, in part, results from believing the larger-later reward is worth waiting for.

In Chapter 2, I explore another factor that influences the decision to wait: the desire for goal closure. While impatience is often portrayed as the preference to receive gains sooner or



postpone costs until later, I find that people are also impatient to incur costs. They prefer to pay more and work more sooner over less later when they have a strong desire for goal closure, such as when it allows them to finish a goal. These findings suggest that the desire to achieve goal closure is an important aspect of time preferences.

Finally, in Chapter 3, I explore how value influences both the experience of waiting and decision to wait. I find that consumers make more patient choices for more valuable rewards, despite anticipating feeling less patient while waiting for more valuable rewards. The same factor that increases the preference to wait—product value—also decreases the experience of patience while waiting. However, when rewards are valuable because they are needed more, patient choices and experiences no longer diverge. These findings highlight the distinction between feeling and acting patient.

## **Chapter 1:**

### **Love is Patient: People are More Willing to Wait for Things They Like**

## Abstract

How does liking of a target affect patience? One possibility is that the more people like a target the less patient they are for it, because it is more difficult to resist the attractive smaller-sooner option in order to wait for the larger-later option. However, across six studies ( $N = 2,774$ ), we found evidence for the opposite effect. Specifically, an increase in liking was correlated with an increase in patience (Study 1), and when people made decisions about a target they liked more, they were more willing to wait for a better quality version of it (Studies 2 and 3) and a larger amount of it (Study 4). This is because when people like a target more, they perceive a greater difference in subjective value between its smaller-sooner and larger-later versions. Thus, the perceived difference in subjective value mediated the effect of liking on patience (Study 5). Further, consistent with this proposed mechanism, we found that liking increased both willingness to wait for a better quality version of a target and willingness to pay to receive the target sooner (Study 6). These findings suggest that patience, in part, results from believing the larger-later reward is worth waiting for. They also offer practical recommendations for people struggling with impatience: Individuals may benefit from reminding themselves why it is they like what they are waiting for.

Suppose you want to replace your old smartphone. You can replace it with the current model available for sale now or you can wait until the next model is released in a few months. This choice presents a classic intertemporal tradeoff: You can choose to receive either the current, less advanced model now (i.e., a “smaller-sooner” option) or the next, more advanced model in a few months (i.e., a “larger-later” option). Given an intertemporal choice between earlier delivery and greater value, patience is defined as the decision to wait for greater value (Ainslie & Haslam, 1992; Frederick, Loewenstein, & O’Donoghue, 2002). Thus, an individual would need to exhibit patience in order to enjoy the state-of-the-art features of the next, more advanced smartphone model.

Patience, or the decision to delay gratification in intertemporal choice, predicts positive life outcomes, including long-term academic success, health, wealth, and reduced risky behavior, such as criminal activity and substance use (Mischel, Shoda, & Rodriguez, 1989; Moffitt et al., 2010; Schlam, Wilson, Shoda, Mischel, & Ayduk, 2013; Shoda, Mischel, & Peake, 1990; Watts, Duncan, & Quan, 2018). Longitudinal studies have even found that preschool children who are able to resist an immediate reward sooner (such as a marshmallow or pretzel) in favor of a better reward later have greater academic achievements and fewer behavioral problems throughout their life (Mischel et al., 1989; Shoda et al., 1990; Watts et al., 2018). Patience is often associated with stronger willpower (Duckworth, Tsukayama, & Kirby, 2013; Mischel et al., 2010). Indeed, these findings were interpreted as suggesting that an individual’s ability to resist an immediate reward, through willpower, enables them to be patient.

However, the decision to delay gratification might not depend *only* on willpower. For example, given the choice between settling for the current smartphone model now and waiting to upgrade to the next model later, someone who loves technology might be very tempted to

upgrade to the current model—much more so than someone who only cares about technology a little. If patience is determined only by an individual’s willpower, then the person who loves technology more would be *less* likely to wait for next model because they would find it harder to resist the temptation of upgrading to the current model immediately (i.e., they would have to exercise greater willpower). However, in this research we test the opposite prediction: A person who loves technology would actually be *more* willing to wait for the next model. This is because while liking a target increases the attractiveness of the smaller-sooner option, it also increases the difference in subjective value between the smaller-sooner and larger-later options. Thus, a technology-lover is more likely to believe the next smartphone model is worth waiting for. More broadly, we explore whether patience stems from the desire to wait, rather than just the ability to do so.

### **Factors that Predict Patience**

There are several factors that predict patience. People are less patient when they are in a “hot,” emotional state. In a “hot” state, people’s cognitive processes support impulsive behavior, such as through increased visual attention to the temptation (Nordgren & Chou, 2011). Consequently, thinking about rewards in “cool” symbolic terms (e.g., thinking of a pretzel as a log vs. a crunchy, salty treat) can increase patience (Metcalf & Mischel, 1999; Mischel et al., 1989; see also distancing techniques, Kross & Ayduk, 2011). Lacking food, sex, medicine, or drugs can also elicit drive states like hunger, sexual desire, pain, or cravings, which reduces patience (Loewenstein, 1996; Nordgren, van der Pligt, & van Harreveld, 2007). Relatedly, people are less patient when the target is emotionally evocative. Thus, an individual can be relatively patient for one type of target but relatively impatient for another (Chapman, 1996; Tsukayama & Duckworth, 2010; Ubfal, 2016).

People's mindset while making an intertemporal choice also impacts their patience. People are more patient when they maintain high-level construal, which promotes cognitive abstraction that highlights goal-relevant features, as opposed to low-level construal, which instead highlights idiosyncratic and unique situational features (Fujita & Carnevale, 2012; Fujita, Trope, Liberman, & Levin-Sagi, 2006). High-level construal encourages consideration of how rewards relate to the decision maker's overall (typically longer-term) goals, resulting in patience. Additionally, people are more patient when they feel more connected to their future selves (Bartels & Urminsky, 2011; Ersner-Hershfield, Wimmer, & Knutson, 2009). When people identify more with their future selves, they are more likely to choose larger-later options that benefit their future selves.

The above factors influence individuals' ability to exercise self-control, and thus, their ability to delay gratification. In these cases, people select the smaller-sooner option because they cannot resist the visceral temptation of the smaller-sooner reward (Loewenstein, 1996; Mischel et al., 1989). Even when people want to wait, they may not have the willpower to do so.

But exercising self-control requires that the person first identifies a self-control conflict, and then, is motivated to resist temptation through willpower (Fishbach & Converse, 2010; Myrseth & Fishbach, 2010). Patience is not always a function of willpower, or an individual's ability to overcome temptation. That is, people are sometimes impatient because they actually prefer the smaller-sooner reward to the larger-later reward. For example, an analysis based on temporal discounting suggests people prefer smaller-sooner to larger-later rewards because they discount the future relative to the present (Frederick et al., 2002). Thus, a person may exhibit impatience because the discounted future reward is not sufficiently large enough to warrant waiting.

Feelings of uncertainty and distrust also reduce the desire to be patient, rather than the ability. People are less patient when they are uncertain if and when the larger-later reward will materialize (McGuire & Kable, 2013) or when they do not trust the person offering the rewards (Michaelson & Munakata, 2016). That is, people are more likely to settle for an immediate smaller reward when they believe waiting increases the likelihood that they will not receive a reward at all.

Finally, people are also more patient when the objective or subjective value of the options is greater. According to the magnitude effect (Loewenstein & Prelec, 1992; Thaler, 1981), people are more patient for larger magnitudes than smaller magnitudes. For example, people believe \$60 in one year is as attractive as \$15 now (median discount rate of 139%), but \$350 in one year is as attractive as \$250 now (median discount rate of 34%). Thus, greater objective values increase patience. Relatedly, imposing a waiting period before an intertemporal choice increases patience by enhancing the subjective value of outcomes (Dai & Fishbach, 2013; Imas, Kuhn, & Mironova, 2016). Specifically, when people were required to wait before making an intertemporal choice, they came to believe that both the smaller-sooner and larger-later options were subjectively more valuable, which increased patience for the larger-later option.

### **How Liking Affects Patience**

Are people more or less patient for things that they like more? The literatures on visceral temptation in delay of gratification and the magnitude effect in intertemporal choice suggest contradictory answers to this question. According to research on visceral temptations, highly valued items are more likely to be processed as “hot” or highly emotional, which reduces self-control (Mischel et al., 1989). When people like something more, they may be particularly tempted to receive a smaller-sooner version of it because the heightened attractiveness leads to a

strong visceral reaction that is hard to resist (Loewenstein, 1996, 2000). Liking a target may thus reduce patience because it makes the smaller-sooner option too tempting to resist (Tsukayama & Duckworth, 2010).

However, liking might instead cause people to become more patient if, when people like a target more, they perceive a greater difference in subjective value between the smaller-sooner and larger-later options. According to the magnitude effect, as the magnitude of the monetary values in an intertemporal choice increase, the absolute difference between the smaller-sooner and larger-later values becomes larger, even though the proportional difference in the values remains the same (Loewenstein & Prelec, 1992; Thaler, 1981). Enhancing the objective values of the options in intertemporal choice increases patience by making the difference in utility more convex. For example, the same person might choose \$10 now over \$20 in one year and *also* choose \$200 in one year over \$100 now. In both cases the ratio of the smaller-sooner to larger-later options is 50%. But this apparent inconsistency arises because the objective marginal value of waiting one year is greater in the latter case (\$100) than the former (\$10). To that end, liking a target more may increase the difference in *subjective* value between the smaller-sooner and larger-later options, and subsequently increase patience.

Attitude research suggests a similar prediction. Positive evaluations predict successful goal pursuit (Ferguson, 2007), possibly by increasing patience. Additionally, objects that evoke strong positive attitudes (i.e., objects people like) automatically attract attention (Roskos-Ewoldsen & Fazio, 1992). This may lead people to spend more time considering the smaller-sooner and later-later options in an intertemporal choice when they like them more. Indeed, liking causes people to draw finer categorical distinctions between options because liking increases elaboration (Smallman, Becker, & Roese, 2014). That is, when people like a target



more they compare, connect, and synthesize ideas related to the target more. For example, a wine lover is able to distinguish between different types of wine in greater detail and with more nuance than a person who does not love wine. Because people who like or maintain a strong positive attitude toward a target may pay more attention to and elaborate more on the smaller-sooner and larger-later options in an intertemporal choice, they are more likely to perceive and discern larger differences in subjective value between them.

Based on this analysis, we predict that people who like a target more perceive a greater difference in subjective value between its smaller-sooner and larger-later versions, compared to people who like a target less. This increases their willingness to wait for the larger-later option. That is, liking increases patience because it increases the value of waiting and thereby, the motivation to resist.

Our main hypothesis, therefore, is that people who like a target a lot will be more patient for a larger quantity or better quality version of it, compared to people who only like the target a little. We explain that this is because liking increases the difference in subjective value between the smaller-sooner and larger-later options. Thus, we predict that this difference in subjective value will mediate the effect of liking on patience.

While we predict liking increases willingness to wait, our account also suggests liking should increase the subjective experience of pain while waiting. Although people are more likely to wait, the wait is more painful for them because a more valuable outcome is in sight. Thus, we further predict that when people like a target more, they will report waiting is more difficult. Consequently, they should be more willing to pay to eliminate the wait. An implication, therefore, is that patience in intertemporal choice will depend on whether the timing of rewards varies with value (i.e., quality or quantity) or with monetary cost. When an intertemporal choice

varies in value (e.g., a choice between a sample of chocolate now and a whole chocolate later), we predict liking increases people's willingness to wait for the better reward. When the intertemporal choice instead varies with monetary cost (e.g., a choice between paying a premium to receive a piece of chocolate now or receiving the same chocolate after a delay), we predict liking will increase willingness to pay to receive the better reward sooner. That is, liking a target will increase patience for a better version of the target, but decrease patience for a cheaper price for the target. This further corroborates the difference in subjective value as the underlying psychological mechanism for the effect of liking on patience, as when people value a target more it is worth both waiting longer and paying more to obtain.

### **The Present Research**

We define liking as subjective value.<sup>1</sup> Throughout our studies, we operationalize liking as higher (a) Likert scale ratings, (b) rankings of options, and (c) willingness to pay (WTP) for targets. This definition is consistent with a positive evaluation or attitude (Roskos-Ewoldsen & Fazio, 1992; Smallman et al., 2014). Additionally, we distinguish liking from need states, such as pain or hunger, which were shown to decrease patience (Loewenstein, 1996; Nordgren, van der Pligt, & van Harreveld, 2007). For example, a hungry person (who needs food) is different from a foodie (who likes food). For a hungry person, the smaller-sooner option has additional value, because by eliminating hunger, it serves a purpose that the larger-later option does not. We predict a foodie, on the other hand, perceives a greater difference in subjective value between the smaller-sooner and larger-later options, which leads them to be more patient for a better quality meal.

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<sup>1</sup> By “subjective value” we are referring to the slope of the utility function. That is, the marginal utility of each additional unit of high-liked item is higher than the marginal utility of each additional unit of low-liked item.

We explored the relationship between liking and patience with intertemporal choices that varied both the quantity and quality of the options across time. That is, we examined how liking of a target impacts the preference both for a smaller quantity sooner versus a larger quantity later, as well as a worse quality sooner versus a better quality later. For example, with respect to a restaurant, we presented participants with either a decision between one free meal sooner versus two free meals later (i.e., varying the quantity of meals) or between ordering from a limited menu sooner versus the full menu later (i.e., varying the quality of the meal).

We used these two empirical approaches to test alternative explanations. In the quality scenarios, people may not intend to use the low quality version of the product, which makes it easier to choose to wait for the better quality version. For example, if presented with a choice between diner coffee now (smaller-sooner option) and upscale-espresso coffee later (larger-later option), a coffee fanatic may not even consider diner coffee to be adequate enough to drink. As a result, the coffee lover's choice to wait for the larger later option would not reflect patience, but instead a selection of the only tolerable option. Therefore, beyond making sure that the smaller-sooner and larger-later options were acceptable to our participants in our studies, we also tested quantity tradeoffs, where both options in the intertemporal choice were of the same quality, but varied in quantity.

However, in choosing between quantities, a person who only likes the target a little may be less likely to want a greater amount of the target. We recognize that more of a target is not always better, even when people like the target. A person who likes coffee may still prefer a medium cup of coffee to a large cup of coffee, because drinking the large cup may have negative side effects (e.g., feeling jittery or not being able to sleep at night). To address this possibility, we presented quantity tradeoffs where the smaller-sooner option is less than a standard portion,

such as a “sample” size. By examining how liking affects intertemporal choices for both the larger quantity and better quality options, we isolated the impact of liking on patience across a wide range of common decisions.

Additionally, we predict that liking a target increases patience only when people have at least some level of baseline liking for the target. That is, we predict people who like a target a lot will be more patient than people who like a target a little. However, we do not make predictions about people’s patience for a target that they actively dislike or do not want at all. A person who does not like a target at all might instead prefer to delay its delivery (Zauberman & Lynch, 2005). For example, in an intertemporal choice between a small portion of coffee sooner and a large portion of coffee later, a person who hates coffee might choose the larger-later option simply to postpone the hassle of dealing with an unwanted item. Therefore, in our studies, we screened participants to ensure that they maintained a baseline level of liking for the options.

We tested our predictions across six studies, summarized in Table 1.1. To maximize power, across studies we calibrated our measures and manipulations with pilot studies. These pilot studies yielded small effect sizes ( $d = .28$ ,  $d = .36$ , and  $d = .40$ ). Accordingly, we targeted a minimum sample of 100 participants per cell to achieve a power of .80. Sample sizes were determined prior to data collection. The studies in this paper incorporate data from participants in the United States recruited online from Amazon Mechanical Turk (MTurk), Prolific Academic, and university participant pools. All studies reported received IRB review and approval. We reported every independent and dependent variable and posted all surveys and data on OSF, along with all studies that we ran using similar paradigms to the studies reported in the paper (<https://tinyurl.com/liking-and-patience-osf>). Finally, we reported participant attrition in Table 1.2 (Zhou & Fishbach, 2016).

## Study 1: The Correlation Between Liking and Patience

Study 1 (preregistered: <http://aspredicted.org/blind.php?x=wz4y3s>) measured the correlation between liking and patience. Participants rated how likely they would be to wait for a larger-quantity or better-quality version of a target, as well as how much they liked the target. We predicted a positive correlation between liking and patience.

### Method

**Participants.** We opened the study to 400 Mturk participants with an approval rating at or above 90% in exchange for \$0.30. We chose this sample size with the goal of recruiting 100 participants per domain. Our final sample included 400 respondents (46% female; mean age = 37.46).

**Procedure.** We first presented a list of five domains: beach vacations, exercise classes, Chipotle Mexican food, seafood restaurants, and Broadway shows. Participants indicated which of these domains they liked: “Please select all of the activities and foods below that you enjoy.” We then presented participants with intertemporal tradeoffs only for domains that they selected from this list (e.g., if a participant indicated they liked beach vacations, exercise classes, and seafood restaurants, that participant answered questions only with respect to these three domains). This resulted in a final sample size of between 75 and 175 participants for each domain.

We randomly assigned participants to either a quantity or quality condition, between-participants. In the quantity condition, participants expressed their patience for a larger amount of each target, while in the quality condition participants expressed their patience for a better version of each target. For example, in the beach vacation domain, those assigned to the quantity condition chose between a two-day beach vacation this weekend and a three-day beach vacation

in one month, while those assigned to the quality condition chose between a beach vacation with mediocre weather this weekend and a beach vacation with warmer weather in one month (see Table 1.3 for stimuli).

For each domain, participants rated their willingness to wait for the larger quantity option (e.g., “How likely are you to wait one month so that you can take a three-day beach vacation?”) or better quality option (e.g., “How likely are you to wait one month for better weather on the beach vacation?”). Participants also rated how much they liked each domain (e.g., “How much do you like beach vacations?”). These questions were presented in counterbalanced order. All items were measured on a seven-point scale ( $-3 = \text{not at all}$ ;  $3 = \text{very much}$ ). Participants repeated the procedure for each of the domains that they selected (up to five).

## **Results and Discussion**

We calculated the correlation between liking of a target and patience for the target within each of the ten domain pairs (five quantity and five quality). In support of the hypothesis, liking positively predicted patience for all domains in the quantity condition,  $r_s > .207$ ,  $p_s < .05$ . Liking also positively predicted patience for all domains in the quality condition,  $r_s > .242$ ,  $p_s < .01$ , except for the exercise class, which was marginally positively correlated,  $r = .199$ ,  $p = .085$ , and for the Broadway show, which was not significantly correlated,  $r = .127$ ,  $p = .236$  (see Table 1.4).

We also combined all five domains to calculate the overall correlation between liking and patience by condition (quality vs. quantity). To account for repeated measurement, we clustered standard errors at the participant level, using the `lm.cluster` command in the “`miceadds`” package for R (Robitzsch, Grund, & Henke, 2017). Liking was positively correlated with patience in the quantity condition,  $r = .305$ ,  $p < .001$ , and quality condition,  $r = .249$ ,  $p < .001$ .

In Study 1 we found that liking was positively correlated with patience across a wide range of domains. When participants liked a target more they were more likely to wait for a larger quantity or better quality version of it. However, because this study is correlational, we were not able to isolate the causal effect of liking on patience (e.g., patience could increase liking). Therefore, in the remaining studies we experimentally manipulated liking.

### **Study 2: Patience for Better Quality**

In Studies 2a–2c, we experimentally manipulated liking to explore its influence on patience for a better quality version of a product. We measured willingness to wait to receive a correct size t-shirt (vs. a t-shirt one size too large; Study 2a), a correct size bed comforter (vs. a bed comforter one size too large; Study 2b), and a standard size mug (vs. a nonstandard smaller mug; Study 2c). To manipulate liking, we asked participants to select their five favorite product designs from a list of 12 (e.g., in Study 2a, participants chose their five favorite t-shirt designs from a list of 12). We then presented an intertemporal choice involving either participants' first favorite design (high liking) or fifth favorite design (low liking). We asked about participants' fifth favorite design in the low liking condition to ensure that they still liked the design enough to want the object, as the fifth favorite design out of 12 was rated in the top half of all designs. We predicted that participants would be more willing to wait for the correct or standard size of their first favorite design (high liking) than their fifth favorite design (low liking).

#### **Method**

**Participants.** We opened each study to 400 MTurk participants with an approval rating at or above 50% in exchange for \$0.40. Our final sample included 400 respondents in Study 2a (46% female; mean age = 36.10), 400 respondents in Study 2b (47% female; mean age = 36.32), and 408 respondents in Study 2c (42% female; mean age = 34.21).

**Procedure.** All participants viewed a set of 12 product designs and selected their five favorite designs. Participants then ranked the five designs that they selected from most- to least-preferred. Participants viewed t-shirt designs in Study 2a, bed comforter designs in Study 2b, and mug designs in Study 2c. In order to increase involvement, participants read that one randomly selected participant would receive the product they chose in the corresponding amount of time.

For each study, we randomly assigned participants to either the high or low liking condition, between-participants. In the high liking condition, participants evaluated an intertemporal choice with respect to the product design they ranked as their first favorite. In the low liking condition, participants evaluated an intertemporal choice with respect to the product design they ranked as their fifth favorite.

To construct these intertemporal choices, in Study 2a, participants indicated their preferred t-shirt size from a list of six options: extra-small, small, medium, large, extra-large, and extra-extra-large. In Study 2b, participants indicated their preferred bed comforter size from a list of six options: twin, twin XL, full, queen, king, and California king. To measure patience, participants reported whether they preferred to receive the correct size version of the product in six months or a version of the product that was one size too large this week: “For the [t-shirt/bed comforter] design below, how likely are you to wait six months for a [insert size] [t-shirt/bed comforter] as opposed to receiving a [t-shirt/bed comforter] that is one size larger this week?”

While the t-shirt and bed comforter sizes were customized to each participant in Studies 2a and 2b, all participants were presented with the same mug size options in Study 2c. To measure patience, participants reported whether they preferred to receive a standard size mug (11oz) in six months or a nonstandard small mug (6oz) this week: “For the mug design below, how likely are you to wait six months for a standard size mug (as pictured, 11oz) as opposed to



receiving an unstandardized small mug (6oz) this week?” In each study, we measured patience in waiting for the larger-later reward (1 = extremely unlikely, 7= extremely likely).

Finally, as a manipulation check, participants rated: “How much do you like the [t-shirt design/comforter/mug] below?” (-3 = not at all, 3 = very much).

## **Results and Discussion**

For each study, the manipulation checks confirmed that participants liked the product design they ranked first more than product design they ranked fifth,  $t_s > 11.15$ ,  $p_s < .001$ . In support of the hypothesis, in Study 2a, participants were more willing to wait for the correct size t-shirt in the high liking condition than in the low liking condition,  $t(398) = 2.80$ ,  $p = .005$ . In Study 2b, participants were more willing to wait for the correct size bed comforter in the high liking condition than in the low liking condition,  $t(398) = 4.02$ ,  $p < .001$ . In Study 2c, participants were more willing to wait for the standard size mug in the high liking condition than in the low liking condition,  $t(406) = 3.65$ ,  $p < .001$  (see Table 1.5).

In Study 2 we found that participants were more likely to wait for a better quality version of a target when they liked the target more (i.e., their first favorite design), compared to when they liked it less (i.e., their fifth favorite design). While these findings provide evidence that liking increases patience on a scale across a range of tradeoffs, Study 3 tested our theory with a dichotomous choice. Will participants choose to wait for a product they love?

### **Study 3: Patience in Consequential Choices**

In order to explore the effect of liking on patience in real decisions, in Study 3 we measured university students’ choice to wait to receive a correct size t-shirt later (vs. a t-shirt one size too large sooner). To manipulate liking, we presented a t-shirt with either high or average liking ratings.

## Method

**Participants.** We opened the study to 200 students from an online participant pool maintained by a large university on the West Coast in exchange for \$1.50; 206 participants responded. We excluded five participants who were not current students at the university, resulting in a final sample of 201 participants (75% female; mean age = 22.05).

**Procedure.** Participants first selected their preferred t-shirt style (men vs. women) and size (extra-small, small, medium, large, extra-large, and extra-extra-large). We then randomly assigned participants to either the high or low liking condition, between-participants. We selected university t-shirts that were more and less well-liked for the high liking and low liking conditions respectively, based on ratings from a panel of students from the same university.

We measured patience with a binary choice: “For the t-shirt design below, would you rather wait ten weeks for a [men or women’s] [correct size] t-shirt or receive a [men or women’s] [one size too large] t-shirt this week?” We told participants that one randomly selected participant would receive the t-shirt they chose in the corresponding amount of time. Finally, as a manipulation check, participants indicated how much they liked their assigned t-shirt design (–3 = not at all, 3 = very much).

## Results and Discussion

The manipulation check confirmed that participants liked the t-shirt more in the high liking condition ( $M = 0.33$ ,  $SD = 1.60$ ) than in the low liking condition ( $M = -0.15$ ,  $SD = 1.49$ ),  $t(199) = 2.20$ ,  $p = .029$ . In support of the hypothesis, participants were more willing to wait for the correct size t-shirt in the high liking condition (57%) than in the low liking condition (38%),  $\chi^2(1, N = 201) = 6.77$ ,  $p = .009$ . That is, when participants liked a t-shirt more, they were more likely to wait ten weeks for the correct size than when they liked the t-shirt less.

Studies 2 and 3 found that people were more willing to wait for a better quality version of a target, such as the correct or standard size, when they liked it more. However, it is possible that people may not intend to use the low quality version of the products tested in Studies 2 and 3. We designed Study 4 to address this possibility.

#### **Study 4: Patience for a Larger Quantity**

In Study 4, to ensure the effect of liking on patience extended beyond just a better quality version of a target, we tested patience for a larger *quantity* of a target, using products for which more is objectively better. Specifically, we predicted that when people liked a food or drink more, they would be more likely to wait to receive a whole portion later, as opposed to receiving a sample of it sooner.

#### **Method**

**Participants.** We opened the study to 300 Prolific Academic participants in exchange for \$0.65; 302 participants responded. We excluded five participants who failed a bot check, resulting in a final sample of 297 participants (51% female; mean age = 34.51).

**Procedure.** We first presented participants with a list of six items: coffee, beer, chocolate, cheese, granola bar, and breakfast cereal. Participants indicated which of these items they liked: “Please select all of the items below that you enjoy consuming.” We then presented participants with intertemporal tradeoffs only for items that they selected from this list (as in Study 1). This resulted in a final sample size of between 70 and 135 participants for each item.

For each item, participants were asked to describe both their favorite type as well as a type that they would consume, but was not their favorite, in an open response. For example, someone who indicated they liked beer might submit “India pale ale” as their favorite type and “lager” as a type they would consume, but is not their favorite.

We randomly assigned participants to either the high or low liking condition, between-participants. In the high liking condition, participants evaluated an intertemporal choice with respect to their favorite type of food or drink. In the low liking condition, participants evaluated an intertemporal choice with respect to a type food or drink they would consume, but was not their favorite. Specifically, participants chose between receiving a sample of the food or drink today or a whole serving in one month. For example, with respect to coffee, participants answered: “Would you prefer to receive a sample of [type of coffee listed] today or a whole cup of [type of coffee listed] in one month?” As a manipulation check, participants rated how much they liked the type of food or drink that they listed ( $-3 = \text{not at all}$ ,  $3 = \text{very much}$ ). Participants repeated the procedure for each of the items that they selected (up to six).

## **Results and Discussion**

The manipulation check for each item confirmed that participants liked their favorite type of food or drink more than the type they would consume but was not their favorite,  $t_s > 9.00$ ,  $p_s < .001$ . In support of the hypothesis, participants were more likely to wait for a larger quantity of their favorite type of food or drink than a type they would consume but was not their favorite,  $X^2_s > 6.60$ ,  $p_s < .05$  (see Table 1.6).

In Study 4, we found participants were more willing to wait for a whole portion of food or drink (compared to receiving a sample portion sooner) when this type of food or drink was their favorite. Despite the temptation of receiving their *favorite* food or drink sooner, we find that people are actually more likely to choose to wait to receive a whole portion of their favorite type of food or drink than a type they like less. Thus, just as people are more patient for a higher quality version of an item when they like it more, people are also more patient for a larger

quantity of an item when they like it more. In the remaining studies we explored the mechanism underlying this effect.

### **Study 5: Difference in Subjective Value**

We propose that liking increases patience because when people like a target more, they perceive a greater difference in subjective value between the smaller-sooner and larger-later options. We tested this mechanism in Study 5 by measuring willingness to pay (WTP) for the smaller-sooner and larger-later versions of different types of water bottles. We predicted that the difference in WTP (i.e., the difference in subjective value) would mediate effect of liking on patience.

We also used the WTP measures to compare the ratio of subjective value between the smaller-sooner and larger-later options between conditions. Research on the magnitude effect finds that people are more patient when the magnitude of the smaller-sooner and larger-later options is higher, even when the ratio between the smaller-sooner and larger later options is the same (Loewenstein & Prelec, 1992; Thaler, 1981). For example, if a person who likes the target a lot values the smaller-sooner and larger-later options at \$6 and \$12, respectively, while a person who likes the target less values them at \$4 and \$8, then the difference in subjective value is greater in the high liking condition (i.e., \$6 vs. \$4) while the ratio is constant (50%). Thus, while liking increases the difference in subjective value between the smaller-sooner and larger-later options, it does not change the ratio. Testing whether liking increases the ratio, in addition to the magnitude, of the difference in subjective value between the smaller-sooner and larger-later options allows us to further decompose the precise nature of the effect.

Finally, in this study, we also measured how difficult participants anticipate the subjective experience of waiting for the larger-later option will be. We predicted that when

participants liked the water bottle more they would find it is more difficult to wait, because the difference in subjective value between the smaller-sooner and larger-later options is greater (i.e., there is more at stake). Thus, when people choose to wait for the things they like, it is *despite* the fact that it is harder for them to do so.

## **Method**

**Participants.** We opened the study to 250 MTurk participants with an approval rating at or above 90% in exchange for \$0.40; 258 participants responded. We excluded 28 participants who failed a bot check and 23 participants who preferred a smaller size (6oz) water bottle to a standard size (18oz) water bottle (as their preference for the smaller-sooner option would not reflect impatience), resulting in a final sample of 207 participants (41% female; mean age = 37.75).

**Procedure.** Participants first read that they would have a chance to win one of two water bottles, either a better, more popular water bottle or a worse, less popular water bottle. We then randomly assigned participants to either the high or low liking condition, between-participants. In the high liking condition, participants had a chance to win a better, more popular water bottle: “The water bottle below is a high quality stainless steel water bottle from Hydro Flask. It is consistently rated as one of the best water bottles, with an average of 5 out of 5 stars from customers.” In the low liking condition, participants had a chance to win a worse, less popular water bottle: “The water bottle below is a plastic water bottle currently on sale at Walmart. It is rated as a mediocre water bottle, with an average of 3.7 out of 5 stars from customers.”

Then, to construct an intertemporal choice, we told participants the water bottle was available in two different sizes: “The 18oz water bottle is the standard and most popular size. The 6oz water bottle is a smaller version, which is one third of the size. The 18oz water bottle is

typically preferred over the 6oz water bottle because it holds more water and fits in a standard cup-holder. However, the standard size water bottle is currently back-ordered.” The 6oz version thus represented the “smaller-sooner” option, while the 18oz version represented the “larger-later” option.

We next measured patience: “For the water bottle below, how likely are you to wait six months for a standard size water bottle (18oz) or receive the smaller version of the water bottle (6oz) this week?” (1 = not at all likely to wait, 7 = extremely likely to wait). In order to assess differences in subjective value, participants answered: “How much would you be willing to pay for the standard size (18oz) water bottle?” and “How much would you be willing to pay for the smaller size (6oz) water bottle?” Participants chose a dollar amount between \$0 and \$40. Then, participants rated how difficult it would be to wait for the larger-later option (1 = not at all difficult, 7 = extremely difficult): “For the water bottle below, how difficult would it be to wait six months for a standard size (18oz) water bottle?” Finally, as a manipulation check, participants rated: “How much do you like the water bottle below?” (-3 = not at all, 3 = very much).

## **Results and Discussion**

The manipulation check confirmed that participants liked the water bottle in the high liking condition ( $M = 1.99$ ,  $SD = 1.05$ ) more than the water bottle in the low liking condition ( $M = -1.36$ ,  $SD = 1.58$ ),  $t(205) = 17.84$ ,  $p < .001$ . In support of our primary hypothesis, participants were more willing to wait six months for the standard size water bottle in the high liking condition ( $M = 5.18$ ,  $SD = 2.18$ ) than in the low liking condition ( $M = 4.08$ ,  $SD = 2.38$ ),  $t(205) = 3.47$ ,  $p = .001$ .

We next calculated the difference in subjective value between the smaller-sooner and larger-later options by subtracting WTP for the 6oz version (high liking condition:  $M = \$7.72$ ,  $SD = 5.94$ ; low liking condition:  $M = \$3.84$ ,  $SD = 6.69$ ) from WTP for the 18oz version (high liking condition:  $M = \$14.54$ ,  $SD = 7.21$ ; low liking condition:  $M = \$5.95$ ,  $SD = 7.69$ ). This difference was greater for participants in the high liking condition ( $M = \$6.82$ ,  $SD = 4.92$ ) than participants in the low liking condition ( $M = \$2.11$ ,  $SD = 3.41$ ),  $t(205) = 8.04$ ,  $p < .001$  (see Figure 1.1).

A mediation analysis (with 10,000 bootstrapped resamples) examined whether these differences in subjective value increased the likelihood of waiting. With the liking condition as the independent variable (low liking = 0, high liking = 1), difference in subjective value as the mediator variable, and the likelihood of waiting as the dependent variable, we observed significant mediation (indirect effect = 0.31,  $SE = 0.15$ , 95% bias-corrected confidence interval  $CI = [0.026, 0.640]$ ).

We also calculated the ratio of WTP for the smaller-sooner option to WTP for the larger-later option (e.g., WTP for larger-later / WTP for smaller-sooner), excluding participants with WTP of \$0 for the smaller-sooner option. We did not find a significant difference in the average ratio between the high liking ( $M = 2.32$ ,  $SD = 1.37$ ) and low liking ( $M = 2.03$ ,  $SD = 0.91$ ) conditions,  $t(177) = 1.60$ ,  $p = .113$ . Similar to the magnitude effect, liking did not significantly affect the ratio of subjective value between the smaller-sooner and larger-later options.

Finally, participants found it more difficult to wait for the standard size water bottle in the high liking condition ( $M = 3.97$ ,  $SD = 2.10$ ) than in the low liking condition ( $M = 3.35$ ,  $SD = 2.28$ ),  $t(205) = 2.04$ ,  $p = .043$ .



Study 5 found that the difference in subjective value between the smaller-sooner and larger-later option mediated the effect of liking on patience. When people liked the water bottle more, they perceived a greater difference in subjective value between the 6oz and 18oz versions of the water bottle, resulting in greater patience.

Additionally, participants were more likely to wait for a water bottle that they liked more *even though* they found it more difficult to wait. That is, participants reported that it would be harder to wait six months for the 18oz water bottle when they liked it more, and yet chose to do so anyway. This suggests that participants in the high liking condition were more tempted by the smaller-sooner option, but nevertheless thought it was worth the wait. Thus, liking seems to increase the preference to be patient, rather than the ability to do so.<sup>2</sup> Since liking makes it seem harder to wait, we would predict that liking increases willingness to wait for a better version of the target but also increases willingness to pay for an expedited delivery of this target. In our final study, we tested for this prediction.

### **Study 6: Liking Increases Subjective Value**

In Study 6, (preregistered: <https://aspredicted.org/blind.php?x=cz86fj>) we presented participants with both an intertemporal choice between time and value (i.e., lower quality now versus higher quality later) as well as time and cost (i.e., pay to receive the item now versus wait to receive it later for free). We predicted that liking would *increase* patience for a better quality version of a target (as in the previous studies) and *decrease* patience for the cheaper price of a

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<sup>2</sup> Alternatively, assessing the difficulty of waiting effectively shines a spotlight on just the larger-later option, leading people to compare the difference in utility between having the larger-later option now versus having it later. Dispossession of a larger-later option will be more painful when it is liked a lot relative to when it is liked a little. Yet, while this is plausible (and consistent with our account), we believe it is more likely that when assessing the difficulty of waiting for a later option people make the more salient comparison of having the smaller option now to having the larger option later, as when making the intertemporal choice.

target. These opposite effects are consistent with our hypothesis that liking increases the difference in subjective value between larger-later and smaller-sooner options. That is, liking increases people's willingness to compromise both time (by waiting for better quality) and money (by paying to receive the item sooner).

Adding a time-cost dilemma further allowed us to test for alternative explanations. First, is it possible that facing liked targets, people have stronger willpower? In that case, they should be more patient both in waiting for a higher quality and in waiting for a late delivery. If it is easier for people to wait, they should both be willing to wait for a better version and a cheaper price. Second, is it possible that people are more patient for a target when they like it more because they are savoring the experience of waiting (Loewenstein, 1987)? Savoring refers to the positive utility derived from anticipating a reward. In some cases, people prefer to delay the reward rather than receive it sooner because they enjoy savoring the wait. Possibly, when people like a target a lot, they may be more likely to savor the wait for the target than when they like it a little. This alternative explanation predicts that when people like a target a lot they are more patient both in waiting for a higher quality and in waiting for a late delivery, compared to when people like the target a little.

In Study 6, we again manipulated liking with different types of water bottles. We then presented participants with (a) an intertemporal choice between time and value (i.e., receive the small size water bottle now or standard size water bottle later), and (b) an intertemporal choice between time and cost (i.e., pay to receive the standard size water bottle now or receive the same water bottle for free later). We predicted that participants would be both more willing to wait for the better quality water bottle and less willing to wait for the free water bottle, when considering

the popular (high liking condition) rather than the unpopular (low liking condition) bottle. This would suggest that liking a target increases patience for the target because people value it more.

## **Method**

**Participants.** We opened the study to 400 Amazon Mechanical Turk participants with approval ratings at or above 90% in exchange for \$0.40; 400 participants responded. We excluded 64 participants who preferred a smaller size (6oz) water bottle to a standard size (18oz) water bottle (as their preference for the smaller-sooner option would not reflect impatience), resulting in a final sample of 336 participants (45% female; mean age = 35.28).

**Procedure.** Participants followed a similar procedure as in Study 5. In order to make the decision consequential, we told participants that one randomly selected participant would receive the water bottle they chose in the associated amount of the time.

Participants made a consequential, binary choice between the two water bottle sizes: “For the water bottle below, would you rather wait six months for a standard size water bottle (18oz) or receive the smaller version of the water bottle (6oz) this week?” Next, participants made a binary choice about whether or not to pay for expedited delivery: “For the water bottle below, would you pay a \$1 expedited delivery fee to receive the standard size water bottle (18oz) this week instead of in six months?” Finally, as a manipulation check, participants rated: “How much do you like the water bottle below?” (–3 = not at all, 3 = very much).

## **Results and Discussion**

The manipulation check confirmed that participants liked the water bottle in the high liking condition ( $M = 2.13$ ,  $SD = 0.90$ ) more than the water bottle in the low liking condition ( $M = -0.71$ ,  $SD = 1.68$ ),  $t(334) = 19.39$ ,  $p < .001$ . In support of the hypothesis, liking increased patience in the time-value dilemma: Participants were more likely to wait for the standard size

water bottle in the high liking condition (82%) than the low liking condition (72%),  $X^2(1, N = 336) = 5.14, p = .023$ . Further, liking decreased patience in the time-cost dilemma: Participants were less likely to wait for the free option in the high liking condition (28%) than the low liking condition (53%),  $X^2(1, N = 336) = 20.57, p < .001$  (see Figure 1.2).

Study 6 found that participants in the high (vs. low) liking condition were more likely to wait six months for the standard size water bottle (i.e., liking increased patience), but less likely to wait six months if they could pay for expedited delivery (i.e., liking decreased patience). These seemingly contradictory effects provide additional evidence for our proposed mechanism: that liking increases patience by increasing the perceived difference in subjective value between the smaller-sooner and larger-later options. When people like a target more, they are more likely to think the additional value from the delayed reward is worth waiting for and the additional value from receiving the reward sooner is worth paying for. Additionally, this finding is inconsistent with the possibility that liking increases willpower or that people were savoring the experience of waiting, as when people liked a target more, they were also willing to incur a cost to eliminate the wait.

### **General Discussion**

Who is more patient: the passionate individual who likes the target a lot or the dispassionate individual who likes the target a little? Across six studies, we found that liking systematically *increased* patience for a wide range of targets. We further found that this is because when people like a target more they perceive a greater difference in subjective value between its smaller-sooner and larger-later versions.

These findings offer a novel insight regarding why people are impatient. That is, people are often impatient because the additional value from the delayed reward is not sufficient to

warrant the wait. In these situations, impatience is not the result of a breakdown of will, but rather, people are impatient simply because waiting is not “worth it.”

These findings enrich our understanding of the two-stage model of self-control (Fishbach & Converse, 2010; Myrseth & Fishbach, 2009). According to this model, what appears like failure to exercise self-control often results from the failure to recognize a self-control dilemma in the first place (e.g., the dieter did not try to resist the dessert because it was a special occasion). With regard to patience, when liking is low, people are less likely to view an intertemporal choice as imposing a self-control dilemma, and thus, less likely to recruit the necessary motivational resources to exercise self-control.

Indeed, our findings help to distinguish self-control failures due to the strength of short-term temptations versus the weakness of long-term goals (Vosgerau, Scopelliti, & Huh, 2019). That is, choice of a smaller-sooner option may occur either because a person cannot resist or is insufficiently motivated to do so. Understanding the role of liking could shed light on which alternative is at play: If a person chooses a smaller-sooner option and has high liking for the target, it probably reflects the former (i.e., low willpower), while if a person chooses a smaller-sooner option and has low liking for the target, it probably reflects the latter (cf. Shaddy, Fishbach, & Simonson, 2021).

Our findings also provide a new perspective on how attitudes influence intertemporal choice. Dual-process models conceptualize patience as a tradeoff between impulses and self-control, where patience reflects the ability to override impulses by engaging in self-control (Hofmann, Friese, & Strack, 2009). However, we find that liking—a positive evaluation or attitude—increases patience. Patience, therefore, reflects not only the ability to override impulses through willpower, but also recognition that it is worth waiting for. Liking a target a lot can yield

patient choices, *even though* it increases the appeal of the smaller-sooner option (as we found in Study 5). On the other hand, liking a target a little can yield impatient choices, even though people have enough willpower to wait (because they simply do not want to).

### **What Accounts for Impatience? The Utility Versus Discounting Functions**

How does liking influence a person's temporal discounting function? We argue that liking does not necessarily need to change the underlying temporal discounting function to yield patient choices (though it may). Liking does, however, necessarily change the slope of the utility function, or the difference in subjective value between the smaller-sooner and larger-later options. As such, liking, in effect, changes the intertemporal tradeoff that needs to be resolved.

For example, in Study 5 we found that participants in the low liking condition valued the standard size water bottle (the larger-later option) at \$5.95 and the smaller size water bottle (the smaller-sooner option) at \$3.84 (difference in subjective value of \$2.11), while participants in the high liking condition valued the standard size water bottle at \$14.54 and the smaller size water bottle at \$7.72 (difference in subjective value of \$6.82). Thus, liking effectively changes the nature of intertemporal tradeoff itself: Participants in the low liking condition decided whether to wait six months for a \$2.11 increase in utility, while participants in the high liking condition decided whether to wait six months for a \$6.82 increase in utility.

Moreover, that differences in subjective value mediated the effect of liking on patience in Study 5 further suggests that patience can result from liking without requiring any assumptions about differences in the discount rate. For example, even if participants in both conditions discounted the future value by the same amount (e.g., 40%), those in the high liking condition would still be more patient. In the low liking condition the subjective value of the larger-later option was \$5.95. Discounted by 40%, it is worth \$3.57. However, in the high liking condition,

the subjective value of the larger-later option was \$14.54. Discounted by 40%, it is worth \$8.74. Thus, even assuming identical discount rates, participants in the high liking condition gain more from waiting. In fact, liking a target more could increase, decrease, or simply not change people's discount rates for the target, but still lead to patient choices, as long as it increases the slope of the utility function enough.

To that end, our findings extend research on the magnitude effect—which finds that greater objective value increases patience in intertemporal choice (Loewenstein & Prelec, 1992; Thaler, 1981)—by exploring how *subjective* value influences patience. For example, while the magnitude effect predicts that people will be more patient for \$100 versus \$10 worth of chocolate, relative to \$10 versus \$1 worth of chocolate (larger objective amounts in the former case), it does not necessarily offer a prediction for whether people who *like* chocolate a lot will be more or less patient than people who like chocolate less (higher subjective values). Indeed, a person who prefers cheaper chocolate (e.g., likes cheaper and sweeter milk chocolate more than expensive, but bitter, dark chocolate) might be more patient for a lower objective value of chocolate than a higher objective value of chocolate because they like the chocolate with the lower objective value more. A corollary is that even controlling for objective value, two people who subjectively value a target differently will nevertheless differ in their patience for it.

## **Implications**

These findings suggest that any factor that influences the sensitivity to differences in subjective value should similarly influence intertemporal choice. For example, gaze has been found to have a multiplicative effect on decision-making, such that gazing at higher valued options has a greater influence on choice than gazing at lower valued options (Smith & Krajbich, 2019). Thus, both liking and visual attention serve to amplify the subjective value of the options.

Additionally, engaging in abstract processing or focusing people on the differences (rather than the similarities) between the smaller-sooner and larger-later options may enhance the perceived difference in subjective value and lead to more patient choices. Future research should continue to explore additional factors that shape differences in subjective value—and subsequently, patience.

Furthermore, our work yields practical implications for predicting patience across various domains. For example, in the domain of education, students may be more patient for subjects that they like more by waiting longer for help before giving up, thinking about ideas for longer, or taking the time to double check their work before submitting. In the domain of health, people may be more patient when they like themselves or value the treatment more. For example, consider a patient who greatly values skincare versus a patient who only moderately values skincare. Both would prefer a better quality Botox treatment, but if such an appointment required a months-long wait and a lesser quality Botox treatment were available sooner, the patient who greatly values skincare might be more likely to think the better quality care is worth waiting for.

Finally, our work suggests untapped strategies for increasing patience. While previous research suggests that people should focus on distancing themselves from the rewards, diminishing the rewards' appeal, and focusing on the goal-relevant features in order to improve patience (Fujita & Carnevale, 2012; Fujita et al., 2006; Kross & Ayduk, 2011; Mischel et al., 1989; Mischel et al., 2010), our findings imply a novel strategy: People should remind themselves how much they like what it is they are waiting for. Instead of downplaying the appeal of rewards, people might explicitly focus on how much better the larger-later reward is than the smaller-sooner reward. For example, people may be able to improve their patience in domains like education and health by reminding themselves how much they like the subject in school or



how much they care about themselves. As previously discussed, strategies or interventions such as elaborating more on the target or engaging in abstract processing might actually help to clarify and expand the relative difference in the value of the smaller-sooner vs. larger-delayed rewards, thereby increasing patience.

### **Limitations and Boundary Conditions**

The current literature on intertemporal decision-making offers contradictory predictions about the potential influence of liking on patience, which the present research helps reconcile. Specifically, past work has suggested that the more viscerally tempting something is, the more difficult it is to resist the immediate option (Loewenstein, 1996; Mischel et al., 1989; Nordgren & Chou, 2011). One critical difference between our findings and this past work is that in all of our paradigms the smaller-sooner option still required *some* waiting (e.g., “this week”). It is possible that liking would lead to impatience for immediately available options. That is, if the smaller-sooner option were sitting directly in front of someone, liking could increase the desire to grab it now. Additionally, we do not claim *all* self-control failures result from insufficient motivation. Indeed, self-control may break when one encounters an overwhelming temptation beyond the “cold” liking in our paradigms (e.g., engaging in unsafe sex in a sexually aroused state).

We are also careful to distinguish liking from need states. Someone with high need might indeed be less patient than someone with low need (e.g., hungry vs. full). However, in this case the smaller-sooner option serves a purpose (i.e., relieving immediate hunger) that the larger-later option does not. Thus, need states may influence patience through a different psychological process than liking. For example, smokers craving a cigarette find smoking more appealing than satiated smokers, who smoked a cigarette recently (Nordgren & Chou, 2011). Similarly, addicts

and substance users are more impatient for their desired substances than for money (Bickel, Odum, & Madden, 1999; Coffey, Gudleski, Saladin, & Brady, 2003; Madden, Petry, Badger, & Bickel, 1997).

Additionally, we find that liking a target increases patience when the larger-later option is available in six months (Studies 1, 2, 3, 5, and 6) as well as one month (Studies 1 and 4). However, we do not expect that our effects would replicate for every time period. For very short time periods (e.g., 30 minutes) the majority of participants may choose to wait, while for very long time periods (e.g., 30 years) the majority of participants may choose not to wait. In these cases, liking may no longer predict patience. Thus, when the delay is longer, the reward needs to be larger to compensate (Ebert & Prelec, 2007; Read, 2001; Zauberman, Kim, Malkoc, & Bettman, 2009).

Finally, we note that in all of our studies, while liking was either low or high, it was always positive. Another potential implication of our theory is that intertemporal tradeoffs involving something that is *disliked* may erroneously suggest patience. For example, if someone does not like a particular food, they might not care whether they receive it now or later (or maybe even gain utility from delaying it as long as possible), which could manifest as decisions that appear patient. We note, however, that in our studies, the low liking conditions offered items that people still desired to some nonzero degree.

## **Conclusion**

We found that liking a target increased patience because people who like the target a lot perceived a greater difference in subjective value between the options in intertemporal choice than people who only like the target a little. This suggests that impatience is the result of a lack of motivation to wait for the larger-later reward and offers practical recommendations for people

struggling to wait: People may improve their patience by reminding themselves why it is they like the object they are waiting for.

## **Chapter 2:**

### **Can't Wait to Pay: The Desire for Goal Closure Increases Impatience for Costs**

## 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 seem like *negative* time discounting), unless we consider the value of earlier goal closure. Across five studies we find that people preferred to pay more money sooner over less money later (Studies 1-2) and complete more work sooner over less work later (Studies 3-5) when it allowed them to achieve their overall goal, more than when it did not. A desire for closure mediated the effect of having an opportunity to achieve a goal on impatience. 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.

Numerous studies have documented impatience as a preference to receive a smaller amount of money sooner over a larger amount of money later (see Berns, Laibson, & Loewenstein, 2007 for a review). There are many reasons for these decisions. For example, people may be tempted by the possibility of buying something they want now or need the money for an immediate purchase. However, another reason why people appear impatient for an earlier option may have nothing to do with the reward itself: Their 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 rather than reduce costs, 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**

Impatience for gains has been studied as the decision to receive a smaller reward sooner instead of waiting for a larger reward later. Consistently, impatience for losses has been studied as the preference 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; Zeng & Feng, 2020). Together, these

patterns of choices imply positive time discounting, where people place less weight on later outcomes than sooner ones. They suggest the value of both costs and benefits is smaller in the future than in the present.

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, Appelt, & Weber, 2013). 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 earlier remedy (Roberts & Fishbach, 2020). This preference reflects impatience because people are opting for a worse outcome sooner rather than waiting for a better outcome later. As another illustration, in a pilot study ( $n = 198$ ; see OSF for more details) 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.

### **Desire for Closure Increases Impatience**

We propose that the desire for goal closure can explain the preference to incur larger costs sooner. People wish to finish goals to achieve psychological closure. They believe completing a goal is a gain and leaving a goal unresolved is a cost. Specifically, goal fulfillment leads to positive affect and achieving goals is associated with greater well-being (Emmons, 1986; Sirgy, 2021).

Further, leaving a goal unresolved is psychologically costly. Unresolved goals automatically attract attention (Moskovitz, 2002), which can 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 tasks, 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 mind. The ability to finish a task and achieve goal closure provides utility beyond the options offered in the intertemporal choice, as it removes concern about ruminating on the unfinished goal (Sun et al., 2015).

When people seek psychological closure, they may be more impatient to conclude tasks than to maximize economic benefits. Thus, when paying sooner enables goal closure, people could be more likely to prefer to pay more sooner than less later. For example, if a person chooses to wait until they have the exact amount to pay for a service, instead of paying more than they owe sooner, they are postponing the goal of finishing the transaction. Though it may seem anomalous to choose to pay a larger amount sooner rather than less later, 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 patience. Without considering the desire for goal 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 goal closure can explain this otherwise contradictory effect: People are more willing to incur a cost sooner when it allows for earlier psychological closure on their goals.

Notably, while we propose that the desire to achieve psychological closure can explain the preference to incur costs sooner, such desire also explains impatience to receive gains. We focus on impatience to incur costs because it allows us to separate the myopic desire to receive a reward sooner from the desire for goal closure. That is, we explore whether people are willing to



incur a larger cost sooner instead of a smaller cost later when it allows them to achieve earlier goal closure.

To illustrate the desire for goal closure, 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. We explore the mechanism underlying the effect and propose that the desire for goal closure not only can explain this seemingly anomalous preference, but also other instances of impatience to incur costs, such as the preference to work more sooner to finish a task.

### **Present Research**

We predict that people are more willing to incur larger costs sooner (vs. smaller costs later) when it allows them to finish a goal earlier compared to when it does not. That is, we predict that people will be more impatient—choosing to pay more money and do more work sooner—if they can complete a goal as a result. This preference will hold even when finishing the work sooner does not affect the timing of the reward.

The preference for sooner-larger costs over later-smaller ones on its own does not imply negative time discounting. Our conjecture is that 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. Thus, by taking the desire for goal closure into account, this seemingly

anomalous preference would actually imply positive time discounting, in particular if the sooner costs are relatively small.

We operationalize the desire for closure in several ways. First, we ask whether people will be more impatient to pay more money or do work when it is the *last step in finishing a goal* rather than the first or middle step in achieving a goal. The desire for goal closure increases as people approach goal attainment. When close to finishing a goal, eagerness to complete the goal increases, which enhances engagement (Brown & Lahey, 2015; Hull, 1934; Kivetz et al., 2006; Koo & Fishbach, 2012; Wadhwa & Kim, 2015). Thus, people may become more impatient to incur costs. 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). We predict that even without introducing a new task, people will not only be willing to earn less money, but actually pay a larger cost sooner when it enables them to finish a focal task. Specifically, because completing the last step in a goal (e.g., getting the last item on a shopping list) achieves goal closure, while completing the first or middle 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 step.

Next, we ask whether people prefer to incur greater costs *sooner* rather than greater costs per se. For example, people might prefer to pay more when it allows them to resolve a debt sooner, but when choosing between paying more or less to close that debt at the same point in time, they would choose to pay less. Thus, impatience results from the preference to conclude a goal sooner, not incur greater costs.

Finally, framing matters. We explore whether people will choose to work more sooner if the work is framed as completing the focal task rather than an additional task. Presenting additional work as competing an existing goal, rather than a new one, should increase impatience

to finish it because it increases the desire for goal closure. Finishing an existing goal provides goal closure, while starting a new goal does not.

These factors should increase impatience to incur costs because they increase the desire for goal closure. Thus, throughout our studies we measure the desire for goal closure (i.e., people's desire to cross the task off their mental list). We predict that the desire for goal closure mediates the effect of the ability to finish a goal earlier on the decision to incur larger costs sooner (vs. smaller costs 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 (Lowenstein, 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). People are willing to incur a larger pain sooner to eliminate the dread of waiting for a smaller pain later.

While the disutility from dread arises from anticipating an upcoming negative event, disutility from the desire for goal closure arises from having an unfinished goal lingering on one's mind. To distinguish the desire for goal closure from dread, we provide participants with choices that elicit the desire for goal closure but do not generate dread (e.g., paying for services, buying holiday gifts, and completing online experiments). We also measure feelings of dread to test it as an alternative explanation.

We tested our predictions across five studies ( $N = 1,041$ ). We summarized the studies in Table 2.1. To maximize power, across studies we calibrated our measures and manipulations

with pilot studies. These pilot studies yielded medium effect sizes (between  $d = .68$  and  $d = .76$ ). Accordingly, we targeted a minimum sample of 75 participants per cell to achieve a power of .80 with a medium effect size. All sample sizes were determined prior to data collection. Full materials and data for all reported experiments and pilot studies are archived on OSF (<https://tinyurl.com/ClosureImpatienceOSF>). We reported participant attrition in Table 2.2 (Zhou & Fishbach, 2016).

### **Study 1: Impatience to Pay to Finish a Service**

We hypothesized that people are more willing to pay a premium to finish a task and achieve goal closure when it allows them to finish a goal compared to when it does not. Therefore, in the context of paying for a service, participants would prefer to pay more money now over less later when the payment is for the last service more than when it is for the 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 and achieves closure. We preregistered Study 1 at [https://aspredicted.org/NXX\\_5Y3](https://aspredicted.org/NXX_5Y3).

### **Methods**

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

**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%),  $X^2(1, N = 194) = 4.29, p = .038$ . 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.

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 they needed compared to the first 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 Pay to Finish a Shopping List

Study 2 tested whether people are more impatient to pay for a product when it allows them to finish a goal. We predicted that participants would be willing to pay more money sooner for a product, instead of waiting to pay less money for the same product later, when it was the last product that they needed to purchase compared to when they were halfway through their purchases.

Specifically, participants made a choice about purchasing a holiday gift for full price (vs. waiting for it to go on sale in two weeks) when it was either the last gift on their holiday shopping list or when they were halfway through their holiday shopping. We used holiday gifts because people often need to buy several of them (i.e., they have a list with beginning and end) and because there is little utility from receiving them sooner, as long as they arrive before the holidays. Participants learned that the gift would arrive before the holidays, regardless of their choice. Thus, there was no advantage to receiving the gift sooner, other than that they could cross it off their list (i.e., achieve goal closure).

Additionally, we measured participants' desire for goal closure. We predicted that the desire for goal closure would be stronger when the gift was the last product to purchase compared to when there were still half of the products left and that desire for closure would mediate the effect of task position on impatience.

### Methods

**Participants.** We opened the survey to 150 participants from the US on Prolific Academic in exchange for \$0.70. Prolific returned 150 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 147 participants (73 women;  $M_{\text{age}} = 33.07$ ,  $SD_{\text{age}} = 11.38$ ).

**Procedure.** We assigned participants to a 2-condition (halfway vs. finish) between-participants design. Participants read a scenario about buying holiday gifts for friends and family. We manipulated how far participants were through their holiday shopping. In the halfway condition, participants read that they bought almost half of the gifts already, and still have half of the gifts left to purchase until they are done with their holiday shopping. In the finish condition, participants instead read that they bought almost all of the gifts already, and only have one gift left to purchase until they are done with their holiday shopping.

All participants read that they found a gift online that they want to purchase. When they go to check out, they see that the website is having a sale starting in two weeks, where all items on the website will be 10% off. They can either choose to buy the gift now for \$30 or come back to the website in two weeks to buy the gift for \$27. Importantly, regardless of what they choose, the gift will arrive before the holidays.

After making their choice, to assess the desire for goal closure, participants rated to what extent their decision was driven by (a) the desire to cross the gift off their list of things to buy, (b) the desire not to think about the holiday shopping anymore, (c) the desire not to leave the holiday shopping unresolved, and (d) the desire to finish the holiday shopping as soon as possible (1 = not at all; 7 = very much). We averaged these measures into a desire for goal closure index (4 items;  $\alpha = .943$ ).<sup>1</sup>

## **Results and Discussion**

In support of our hypothesis, participants were more likely to choose to buy the gift now for \$30 in the finish condition (66%) than in the halfway condition (44%),  $X^2(1, N = 147) =$

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<sup>1</sup> Given that the final measure in the desire for goal closure index (i.e., “the desire to finish the holiday shopping 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 2, 4, and 5 when excluding the final measure.

7.27,  $p = .007$ . That is, participants were more likely to choose to pay more money for the same product when it allowed them to finish their shopping compared to when they were only halfway through.

Additionally, as predicted, participants had a greater desire for goal closure in the finish condition ( $M = 4.85$ ,  $SD = 2.02$ ) than the halfway condition ( $M = 3.70$ ,  $SD = 2.12$ ),  $t(145) = 3.36$ ,  $p = .001$ . The desire for goal closure mediated the effect of task position (halfway vs. finish) on the decision to pay more money to buy the gift sooner (using Model 4 of SPSS Macro MEDIATE with 10,000 samples; Hayes 2017), indirect effect = -1.63,  $SE = 0.60$ , 95% CI = [-3.06, -0.68].

In this study, participants were more impatient to pay for a gift when it was the last gift that they needed to purchase compared to when they still had half of the gifts left to purchase. Additionally, participants felt a stronger desire for goal closure when they were able to finish their goal (compared to when they were halfway), which mediated the effect of the distance to goal attainment on impatience to incur costs. People are more impatient to pay when they have a stronger desire for goal closure.

### **Study 3: Impatience to Work to Finish a Task Sooner**

Moving from impatience to pay to impatience to complete work, in Study 3 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 password transcription task that offered the same payment. We predicted that participants would be more likely to choose to complete the longer task when it allowed them to finish the task sooner. We compared this condition to two conditions in which the long and the



short tasks 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 task, rather than a possible inherent interest in completing longer tasks *per se*. Importantly, the sooner task occurred the next day (as opposed to immediately after finishing the study). This ensured that the cost of reengagement was similar for both tasks, 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. MTurk returned 301 respondents (132 women;  $M_{\text{age}} = 36.23$ ,  $SD_{\text{age}} = 11.10$ ).

**Procedure.** We assigned participants to a 3-condition (longer task sooner vs. both tasks sooner vs. both tasks later) between-participants design. Participants chose between transcribing either 20 or 17 ten-character alphanumeric passwords (e.g., 3atAmyNZ5P). In the longer-task-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.

Participants were always paid the same amount (a \$1.00 bonus) in one month for transcribing the passwords and had 24 hours to complete the task once it was available, regardless of their choice. Participants had to pass comprehension checks before submitting their choice.

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 bonus

task when it occurred the next day (56%) and in one month (51%),  $X^2(1, N = 301) = 0.60, p = .438$ , 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 to complete the longer task in the longer-sooner condition (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 task when it occurred sooner than the shorter task than when it occurred at the same time as the shorter task.

In Study 3, 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 4: Impatience to Work as a Function of Task Position**

In Study 4 we presented an incentive-compatible work task as first or last in a sequence. We predicted that participants would have greater desire for closure, and hence be more impatient, when the task was last versus first. Specifically, using the same password transcription task as in Study 3, we predicted participants would be more interested in completing a longer version of the task sooner if it was the last step they needed to complete versus the first. 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 4 at <https://aspredicted.org/blind.php?x=f6cg4h>.

## **Methods**

**Participants.** We opened the survey to 200 participants from the US on MTurk in exchange for \$0.40. MTurk returned 199 respondents (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 password transcription task, which 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 completed 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 passwords or 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. As before, participants learned they would receive their (fixed) payment after a month, regardless of their choice, and completed comprehension questions before making their choice.

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 bonus tasks off their list of things to do, (b) the desire not to think about the bonus tasks for a long time, (c) the desire not to leave the bonus tasks unresolved, and (d) the desire to finish the bonus tasks as soon as possible (1 = not at all; 7 = very much). These items were adopted from Study 2 and 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 bonus 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 bonus task regardless of whether it occurred that week (32%) or the next month (41%),  $X^2(1, N = 199) = 1.74, p = .187$ , 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 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%),  $X^2(1, N = 199) = 4.10, p = .043$ .<sup>2</sup>

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 MEDIATE 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 do more work sooner—when making a choice with regard to a task that will 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.

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<sup>2</sup> Given the small effect size, we ran a replication of the study (in the supplemental materials on OSF), which again found a similar result ( $X^2(1, N = 257) = 4.21, p = .040$ ).

### **Study 5: 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 a separate from previous work, they will be more patient to postpone doing it. We tested this prediction using a 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), which would mediate the effect of impatience 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; Lowenstein, 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 5 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 5 at <https://aspredicted.org/blind.php?x=cc7925>.

## 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. The participant pool returned 200 respondents (136 women;  $M_{\text{age}} = 29.13$ ,  $SD_{\text{age}} = 11.94$ ).

**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 a month, regardless of their choice or condition, and completed comprehension questions before making their choice. Thus, the only difference between conditions was in the framing of the fourth task.

To assess the desire for goal closure, participants then rated four items adapted from Study 2, 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;  $a = .817$ ).

Additionally, participants answered 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 Zauberan and Lynch (2004).

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 MEDIATE with 10,000 samples; Hayes, 2017), indirect effect = -0.64, SE = 0.22, 95% CI = [-1.14, -0.28].

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 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 5, 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 5 tests several alternative explanations for our effect, and finds 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.

### **General Discussion**

While traditional models of intertemporal choice predict that people want to delay costs, we find that people can also display impatience to incur costs. We propose that a desire for goal closure can explain this seemingly anomalous preference. That is, people prefer to pay and work sooner more when they desire goal closure, such as when completing the task allows them to finish a goal. Further, accounting for the desire for goal closure can explain impatience to incur larger costs sooner (vs. smaller costs later), which otherwise appears as discounting the *present* rather than the future.

Our findings highlight how the desire for goal closure influences intertemporal choices. While impatience to incur larger costs sooner (vs. smaller costs later) has been observed at times

(Chapman, 1996; Hardisty et al., 2013; Roberts & Fishbach, 2020), the desire for goal closure explains why impatience increases when people are able to finish a goal or when a task is framed as the end of a goal (as opposed to the start of a new goal). We extend previous findings on impatience to incur costs by exploring the situations that increase the desire for goal closure in the context of intertemporal choice.

Our findings suggest potential interventions to improve patience by decreasing 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. 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 to postpone completing work, 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.

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; Lowenstein, 1987; Mischel et al., 1969; Sun et al., 2015), perceptions of available time (Zauberman & Lynch, 2005), 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.

Additionally, other factors may increase the desire to schedule negative events sooner, including the preference for an improving sequence of events (Chapman, 2000; Schmitt & Kemper, 1996) and risk aversion (Halvey, 2008). Scheduling negative events sooner allows for an improving sequence of events, where worse events come before better ones. For example, people prefer to receive income that increases over time, even though it requires waiting to receive larger payoffs later (Frank & Hutchens, 1993; Loewenstein & Sicherman, 1991). However, in our studies, scheduling the payment or work sooner did not result in an improving sequence. Risk aversion can also explain why people sometimes prefer to schedule negative events sooner (Walker et al., 2018; Zlatev et al., 2020). Delaying the completion of a task increases the risk that it will not be completed at all. However, in our Study 5, framing a fourth task as the “final” task opposed to a “bonus” task did not influence the risk that participants forgot to complete the task. Indeed, participants were similarly likely to complete the final task, regardless of the framing. Thus, we add to the literature on scheduling costlier events sooner while documenting the distinct effect of a desire for goal closure.

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, 2015). Indeed, the burden of carrying debt can reduce people’s overall subjective well-being (Brown, Taylor, & Price, 2005; Greenberg & Mogilner, 2020). One reason why people may be averse to accruing debt is because of the mental cost of leaving debt unresolved. That is, the inability to achieve closure on the debt may increase the subjective cost of borrowing money. Similarly, people might be averse to take 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 experience the satisfaction from achieving goal closure. Using a similar password transcription task as in our studies, Brown and Lahey (2015) found that completing the smallest parts of a task first increases the likelihood that people complete the entire task. Prioritizing easier tasks first allows people to quickly achieve a sense of goal closure, which may motivate them to finish 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.

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, 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.

### **Limitations and Boundary Conditions**

Does the desire to achieve closure only affect impatience to incur costs? Likely not. This desire can explain the preference to both receive gains and incur losses sooner. Throughout our studies, we tested impatience to pay more money and complete more work sooner because standard models of intertemporal choice do not predict this behavior. However, the desire for goal closure may influence impatience in other types of intertemporal choices as well. For example, one reason people may prefer small immediate gains to larger delayed gains is because they want to achieve earlier closure. Indeed, if people who are impatient to receive a smaller amount of money sooner save their gains for later instead of using them immediately, it suggests they may have chosen to receive the money sooner to achieve earlier closure rather than for earlier consumption.

Additionally, 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 it allows them to finish a task earlier. 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. 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, people may not be impatient.

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 have a strong desire for goal closure. Additional research is needed to continue to explore the situations that evoke a strong desire for goal closure, and subsequently, impatience.

**Chapter 3:**  
**When Impatient People Behave Patiently**

## **Abstract**

When a product is more valuable, consumers are more likely to wait for a superior version of it later (vs. an inferior version sooner). Yet, despite behaving more patiently, consumers experience less patience waiting for more valuable products. Thus, patient choices and experiences diverge (Studies 1-2). For example, participants were more likely to wait for two mugs later (vs. one mug sooner) when the mugs were of higher quality, even though it was harder to wait for higher quality mugs. Consumers' desire for the reward mediated the effect of value on patient choice (Study 3). They chose to wait for higher quality products because they desired them more, despite that they were harder to wait for. We further explore a boundary condition for the effect. When products were more valuable because they were more needed (e.g., hungrier people value food more), consumers were less likely to wait and experienced less patience (Studies 4 and 5). Hence, patient decisions and experiences no longer diverged. We discuss implications for what causes patient consumer behavior and the distinction between feeling and acting patient.



Good things come to those who wait, as the saying goes. Consumers who choose to wait for a newer smartphone model instead of buying an older model sooner end up with more advanced features on their phone. Diners who choose to wait for a seat at a restaurant instead of eating fast food often enjoy a more delicious and nutritious meal. And travelers who are willing to postpone their trip will often fly for cheaper price.

Further, consumers are more likely to wait for better things. For example, according to the magnitude effect, people are more likely to wait for larger magnitudes of money (e.g., more likely to wait for \$100 in six months over \$80 today than for \$10 in six months over \$8 today; Thaler, 1981). More valuable rewards are more worth waiting for.

But waiting is not easy. And when it comes to the experience of patience, more valuable rewards may be harder to wait for. For example, waiting for an indulgent vacation at a luxury resort may be harder than waiting for a less tempting vacation at a standard hotel. The luxury resort is more enticing than the standard hotel, and so it is more painful to wait for. In this case, the same factor that makes it harder to wait—the quality of the hotel—also increases the desire to wait, which makes it more likely that the consumer will choose to wait.

In the present research, we explore how an increase in the value of a product distinctively influences the experience of patience and the decision to behave patiently. We propose that more valuable rewards make it harder to wait but also increase the likelihood of waiting. Thus, the experience of patience and decision to be patient diverge. For example, in an intertemporal dilemma between a two-night vacation sooner and a three-night vacation later, when the vacation is in a better hotel, consumers will feel less patient waiting but behave more patiently (choosing the three-night vacation).

We further predict that consumers' desire for the product, rather than their experience of patience, mediates the effect of the products' value on patient choice. That is, unless the product is valued because it is needed. When consumers wait for rewards that they *need* more (e.g., waiting for food when hungrier vs. less hungry), they both experience less patience and behave less patiently. In that case, patient experiences and choices no longer diverge, and the experience of patience mediates the effect of need on the decision to wait.

### **Two Types of Patience**

Patience is typically studied as the decision to delay gratification in an intertemporal choice (Berns et al., 2017; Frederick et al., 2002; Lempert & Phelps, 2016; Malkoc & Zauberan, 2019; Zauberan & Urminsky, 2015). Patient consumers choose to wait for a larger-later option instead of receiving a smaller-sooner option. For example, they might choose to wait three months for a \$30 bonus (vs. a \$20 bonus that week) or a three-day vacation (vs. a two-day vacation that week).

But in addition to the decision to wait, patience is also defined as the subjective experience while waiting. It is the ability to wait without suffering (Barragan-Jason et al., 2018; Roberts & Fishbach, 2020; Schnitker, 2012). Patience determines how consumers feel waiting to be seated at a restaurant (Huang et al., 2016) or for a purchase to arrive in the mail (Kumar et al., 2014). Patient consumers feel calm and relaxed while they wait, whereas impatient consumers instead feel upset and agitated.

The experience of patience is an inherent part of patient decision-making. When consumers choose the larger-later option in an intertemporal choice, they must then endure the wait for it to arrive. That is, after opting to wait for the \$30 bonus or the three-day vacation in an intertemporal choice (vs. \$20 or a two-day vacation sooner), patient consumers will feel better

while waiting three months for it to arrive. Indeed, regardless of consumers' *actual* feelings of impatience while waiting, the *anticipated* feeling of impatience can influence patient decision-making. Often when consumers make an intertemporal choice, they only know how they anticipate they will feel while waiting. Thus, even the anticipated experience of waiting can impact decision-making.

Consumers who feel (or anticipate feeling) more patient while waiting may be more likely to choose to wait. Indeed, the feeling of impatience is often considered the psychological mechanism for impatient choices. When people feel like they will struggle with waiting, they are less likely to choose to wait. For example, the feeling of impatience can explain time inconsistent preferences, such as the sign effect, where gains are discounted more than losses (Rachlin & Raineri, 1992). Presumably, consumers have higher discount rates for gains than for losses because waiting for losses feels worse than waiting for gains (Hardisty & Weber, 2020). In this case, people are less likely to wait when waiting is more unpleasant.

Additionally, consumers are more patient for experiences than for material goods because they feel less impatient when waiting for experiences than for consumer goods (Kumar & Gilovich, 2016). And children who can wait patiently, without fidgeting or squirming, are more likely to wait longer in the marshmallow test (Barragan-Jason et al., 2018).

In all these situations, people make more patient choices because they feel, or anticipate feeling, patient while they wait. It is often assumed that when a consumer chooses to wait it is a sign that they feel patient waiting. As a result, the two definitions of patience—the experience and the choice—are used interchangeably.

But is this always the case? In the present research, we explore situations where consumers anticipate feeling less patient while waiting, despite being more likely to choose to wait.

### **Can Impatient People Act Patiently?**

When people make patient choices, it does not inherently mean that they expect to feel patient while waiting. Indeed, there are situations where people may be more likely to wait when it is not easier (and potentially harder) for them to do so. For example, according to the magnitude effect, people are more likely to wait for larger magnitudes of money (e.g., more likely to wait for \$100 in six months over \$80 today than for \$10 in six months over \$8 today; Thaler, 1981). Further, consumers are more likely to wait longer to receive a better version of products that they like more. When making a choice between waiting 20 minutes for a large cup of coffee or drinking a small cup immediately, consumers are more likely to wait for their favorite type of coffee than a type that is not their favorite (Roberts et al., 2021).

It is unclear that waiting for larger magnitudes of money and more well-liked consumer products is easier. Indeed, it might be harder. People may feel more impatient waiting to receive \$100 than waiting for \$10. Similarly, they may struggle to wait for their favorite type of coffee but find it easy to wait for a less well-liked type. If this is the case, then people might be more likely to wait in situations where it is harder for them to do so.

In general, more valuable rewards are both more desirable and harder to wait for. The same factor that makes the decision to wait worthwhile simultaneously makes the experience of waiting more painful. Thus, when making choices about more valuable rewards, consumers have a larger incentive to wait even though it may be harder for them to do so. And so, if their choice

is primarily driven by the value of the reward, they may make more patient decisions despite feeling more impatient while waiting.

Thus, we predict that consumers may be more likely to wait for more valuable rewards, even though it is harder for them to do so. Stated formally:

***H1a.** When waiting for rewards that are more valuable, consumers make more patient choices, but anticipate feeling less patient while waiting.*

For more valuable rewards, patient choices and experiences diverge. Specifically, we predict consumers are more likely to wait for more valuable rewards—such as larger magnitude of money, better quality products, or rewards that they like more—even though it is harder to wait for these more valuable rewards.

Because of this divergence, the effect of reward value on patient decision making cannot be explained by the experience of patience. Instead, we predict that consumers' desire for more valuable rewards mediates the effect of reward value on choice. Stated formally:

***H1b.** When waiting for rewards that are more valuable, consumers' desire for the reward (rather than their experience waiting) underlies the effect on patient choice.*

To test this hypothesis, throughout our studies we measured patience as both a choice and an experience. To measure patient decision-making, participants either rated their likelihood of waiting for the larger-later option in an intertemporal choice or decided whether to wait. To measure patient experiences, participants rated their anticipated feelings of impatience while waiting, which we reverse-coded into a patient experience measure. Thus, the patience measures reflect the ease of waiting.

An alternative explanation for the opposite effects of reward value on patient experience and choice is that people enjoy feeling impatient while waiting. If the experience of patience is

negative (and the experience of impatience is positive), the effects of reward value on experience and choice would be consistent. People would be more likely to wait when they enjoy waiting more.

Indeed, in some situations, consumers savor the experience of waiting, which is a positive feeling of anticipation (Hardisty & Weber, 2020; Kumar et al., 2014; Nowlis et al., 2004). When people savor the experience of waiting, they may prefer to wait longer because they enjoy the wait. For example, in one classic study (Loewenstein, 1987), consumers were willing to pay more for a kiss with a movie star when it was in a few days compared to a few hours. They preferred to wait longer for the kiss.

This alternative theory predicts that consumers are more likely to wait for valuable rewards because they enjoy waiting for them more. In contrast, we predict that waiting for more valuable rewards is less enjoyable. To test whether participants enjoy waiting, we also measure their willingness to pay to eliminate the wait (i.e., an expedited delivery fee; Chen et al., 2005; Huang et al., 2016; May & Monga, 2014). We predict that consumers will be willing to pay more for expedited delivery for more valuable rewards. This pattern would suggest that they are not savoring the experience of waiting for more valuable rewards, as they are willing to pay more to eliminate it.

### **Waiting for Needs**

We predict that consumers are more likely to wait for more desirable rewards. But what about the difficulty of waiting? Are there situations when people make impatient choices for more valuable rewards because they feel too impatient to wait? Even if they *want* to wait, consumers may not feel they possess the *ability* to wait (Roberts & Fishbach, 2022). For

example, people might choose to take antibiotics instead of waiting for an ailment to heal naturally because they anticipate too much discomfort to be able to wait.

When consumers believe they may lack the ability to wait, their experience (actual or anticipated) while waiting may influence the decision to wait. Accordingly, impatient experiences will lead to impatient choices. In these situations, the experience of waiting may play a larger role in decision-making than the desirability of the reward.

Specifically, when the increase in reward value is the outcome of stronger need—because the consumer requires the reward more—we expect consumers will feel less patient and make decisions that are less patient. Indeed, need states—such as hunger, thirst, or pain—both increase the difficulty of waiting and the desire to relieve the need (Loewenstein, 1996). When hungry, waiting for food becomes more painful and receiving food becomes more desirable. And smokers craving a cigarette rate smoking as more pleasurable than satiated smokers (Norden & Chou, 2011).

Need states undermine patience. People are less patient for food, drinks, or drugs when they are hungry, thirsty, or in withdrawal (Loewenstein, 1996; Norden & Chou, 2011). Need states can even decrease patience across domains. Sexually aroused men were less patient when choosing between monetary rewards (they preferred the smaller-sooner amounts; Kim & Zauberman, 2013; Van den Bergh et al., 2008).

We predict that when people perceive that a reward is needed more, they experience greater impatience and are less likely to wait. That is, when a reward is more valuable because it is needed more, the person will be less likely to wait in situations where it is harder to wait, despite that the reward is more desirable.

For example, a consumer who needs a new phone more may be more willing to settle for a worse phone sooner (instead of waiting for a newer model later). This person might subjectively value having a phone more, yet they are impatient in both their experience and choice. They make impatient choices when they anticipate feeling less patient waiting. Stated formally:

***H2a.** When waiting for rewards that are needed more, consumers make less patient choices and anticipate feeling less patient while waiting.*

And:

***H2b.** When waiting for rewards that are needed more, consumers' experience waiting (rather than their desire for the reward) underlies the effect on patient choice.*

The strength of a need has similar impact on patient choices and experiences. Thus, the perception of a product as satisfying a need versus want matters. If consumers feel a product is essential for their wellbeing, they will perceive it as a need. They may think of a food, for example, as satisfying their hunger and therefore essential. The stronger is the need (e.g., the hungrier they are) the harder it is to wait for a larger-later portion and the less likely they are to wait. Alternatively, the same product can be valuable for other reasons. Consumers may value food because it is delicious, rather than because it satisfies their hunger, in which case the more they like the food, the harder it is to wait but the more likely they are to do so.

We tested our predictions across six studies ( $N = 1,341$ ), four of which were preregistered. We summarized our findings in Table 3.1. To maximize power, across studies we calibrated our measures and manipulations with pilot studies. These pilot studies yielded small to large effect sizes depending on the paradigm (between  $d = .39$  and  $d = 1.07$  for patient experience and  $d = .17$  and  $d = 1.85$  for patient choice). As a standard, we did not recruit less



than 50 participants per cell. However, we increased our sample size for studies with a small pilot effect (at most 300 per cell to achieve a power of .80 with a small effect size). All sample sizes were determined prior to data collection. Full materials and data for all reported experiments and pilot studies are archived on OSF (<https://tinyurl.com/ImpatientBehavePatientlyOSF>). We reported participant attrition in Table 3.2 (Zhou & Fishbach, 2016).

### **Study 1: Patient Experience and Choice**

We hypothesized that people would make more patient choices but feel less patient waiting for more valuable rewards (H1a). We tested this hypothesis in Study 1 by presenting participants with five different bonus rewards: \$10, \$50, \$100, \$500, vs. \$1,000. Consistent with the magnitude effect (Thaler, 1981), we predicted that participants would be more likely to wait three months to get the full amount (vs. half the amount immediately), for larger magnitudes (e.g., for \$1,000 later vs. \$500 now compared to for \$10 later vs. \$5 now). We further predicted that participants would report feeling less patient while waiting for larger magnitudes of money. Thus, we predicted an interaction between the amount of money and the measure of patience (choice vs. experience).

In addition to measuring participants' experience of patience directly (by asking how they anticipate feeling), we also measured the experience of patience indirectly, by asking how much participants were willing to pay for expedited delivery to eliminate the wait. The expedited delivery measure allowed us to address the possibility that the experience of impatience is inherently enjoyable, and people are more likely to wait when they enjoy waiting. We assume impatience is an uncomfortable experience and, therefore, participants would pay more to

eliminate the wait for larger magnitudes of money. We preregistered Study 1 at [https://aspredicted.org/S4Z\\_5YV](https://aspredicted.org/S4Z_5YV).

## Methods

We opened the survey to 300 US participants on Prolific Academic in exchange for \$0.45. Prolific returned 300 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 298 participants (147 women;  $M_{\text{age}} = 32.97$ ,  $SD_{\text{age}} = 11.98$ ).

We used a 3 (Patience Measure: patient choice vs. patient experience vs. expedited delivery)  $\times$  5 (Amount: \$10 vs. \$50 vs. \$100 vs. \$500 vs. \$1,000) mixed-participants design, where Patience Measure was between-subjects and Amount was within-subjects.

Participants answered questions about five different bonus amounts in a counter-balanced order: \$10, \$50, \$100, \$500, and \$1,000. Participants answered different questions about each of the bonus amounts depending on their condition.

Participants in the patient choice condition rated how likely they were to wait three months for the bonuses instead of receiving half of that amount immediately (1 = not at all, 7 = very). Specifically, participants rated how likely they were to wait three months for \$10 instead of \$5 immediately, \$50 instead of \$25 immediately, \$100 instead of \$50 immediately, \$500 instead of \$250 immediately, and \$1,000 instead of \$500 immediately.

Participants in the patient experience condition rated how impatient they would feel and how difficult it would be to wait three months for the bonus amounts (1 = not at all, 7 = very; reverse-coded). We averaged these measures into a patient experience index (2 items; for the five amounts,  $r_s > .820$ ). In all studies, we reverse-coded the patient experience items because we anticipated participants could more easily identify feelings of discomfort while waiting rather

than a lack of discomfort, but we wanted the patient experience measures to be consistent with the patience choice measures for easier comparisons.

Participants in the expedited delivery condition rated how much they were willing to pay to eliminate a three month wait for the bonus amounts and receive the money immediately instead (\$0 to \$100).

## **Results and Discussion**

In support of H1a, an ANOVA of the likelihood of waiting for the larger-later option revealed an effect for the magnitude of the rewards ( $F(4, 384) = 77.40, p < .001$ ). A linear within-participants contrast revealed that participants were more likely to choose to wait when deciding between larger magnitudes of money ( $F(1, 96) = 132.44, p < .001$ ). Using pairwise comparisons, we found that participants were more likely to wait for \$1,000 in three months (vs. \$500 immediately) than they were for \$500 in three months (vs. \$250 immediately;  $p < .001$ ), \$100 in three months (vs. \$250 immediately;  $p < .001$ ), \$50 in three months (vs. \$25 immediately;  $p < .001$ ), and \$10 in three months (vs. \$5 immediately;  $p < .001$ ).

Additionally, an ANOVA of participants' feelings of patience revealed an effect for the magnitude of the rewards ( $F(4, 412) = 14.85, p < .001$ ). A linear within-participants contrast revealed that participants anticipated feeling less patient waiting for larger magnitudes of money ( $F(1,103) = 18.74, p < .001$ ). Using pairwise comparisons, we found that participants anticipated feeling less patient waiting three months for \$1,000 than for \$500 ( $p < .001$ ), \$100 ( $p < .001$ ), \$50 ( $p < .001$ ), and \$10 ( $p < .001$ ).

We further found a significant interaction between patient choices and experiences ( $F(4, 796) = 71.31, p < .001$ ). Participants made more patient choices but felt less patient waiting for larger magnitudes of money (see Figure 3.1). We also found a main effect of Amount ( $F(4, 796)$

= 9.26,  $p < .001$ ), where participants were more patient overall (across experience and choice) for larger magnitudes of money. There was no significant main effect of the Patience Measure ( $p = .476$ ). We did not have predictions about these main effects.

Finally, an ANOVA of the expedited delivery fee revealed an effect for the magnitude of the rewards ( $F(4, 384) = 121.64, p < .001$ ). A linear within-participants contrast revealed that participants paid more for expedited delivery for larger magnitudes of money ( $F(1, 96) = 151.19, p < .001$ ). Using pairwise comparisons, we found that participants paid more for expedited delivery for \$1,000 ( $M = \$46.98, SD = 36.02$ ) than for \$500 ( $M = \$29.93, SD = 29.89; p < .001$ ), \$100 ( $M = \$9.89, SD = 12.74; p < .001$ ), \$50 ( $M = \$5.25, SD = 8.77; p < .001$ ), and \$10 ( $M = \$1.96, SD = 8.01; p < .001$ ).

Participants were more likely to wait longer for larger magnitudes of money (instead of receiving half of the amount sooner), even though they anticipated feeling less patient when waiting for larger magnitudes of money. For example, even though it was harder to wait three months for \$1,000 than it was to wait the same amount of time for \$10, people were more likely to wait for \$1,000 in three months than \$10 in three months (instead of receive half of the amounts immediately). Additionally, participants were willing to pay more money to eliminate the wait for larger magnitudes of money, which suggests that they were not savoring their experience waiting, but rather, that they disliked waiting more for larger magnitudes of money. Whether people are more patient for larger magnitudes of money depends on whether researchers measure patience as an experience or a choice.

### **Study 2: Incentive-Compatible Patient Experience and Choice**

Moving to incentive-compatible studies, in Study 2a we tested whether participants would make more patient choices but expect to feel less patient for a larger bonus cash reward

(i.e., deciding between \$50 later vs. \$40 sooner, compared with \$5 later vs. \$4 sooner). We preregistered Study 2a at [https://aspredicted.org/BWW\\_Z94](https://aspredicted.org/BWW_Z94). In the context of consumer products, in Study 2b, we tested whether participants would make more patient choices but feel less patient when deciding to wait for two high quality mugs compared with two low quality mugs (vs. getting one mug sooner).

## Study 2a

**Methods.** We opened the survey to 300 US participants on Prolific Academic in exchange for \$0.30. Prolific returned 300 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 295 participants (144 women;  $M_{\text{age}} = 34.08$ ,  $SD_{\text{age}} = 11.55$ ).

We used a 3 (Patience Measure: patient choice vs. patient experience vs. expedited delivery)  $\times$  2 (Amount: \$5 vs. \$50) mixed-participants design, where Patience Measure was between-subjects and Amount was within-subjects.

Participants answered questions about two different bonus amounts in a counter-balanced order: \$5 and \$50. Participants learned that one person in the study would be randomly selected to receive the bonus that they chose.

Participants answered different questions about each of the bonus amounts depending on their condition. Participants in the patient choice condition made two dichotomous choices: (a) a choice to receive a \$50 bonus in three months or a \$40 bonus that day and (b) a choice to receive a \$5 bonus in three months or a \$4 bonus that day.

Participants in the patient experience condition rated how impatient they would feel and how difficult it would be to wait three months for the bonus amounts (1 = not at all, 7 = very; reverse-coded). We averaged these measures into a patient experience index (2 items;  $r_{50} = .816$ ,

$r_5 = .891$ ). Participants in the expedited delivery condition rated how much they were willing to pay to eliminate a three month wait for the bonus amounts and receive the money immediately instead (\$0 to \$50).

**Results and Discussion.** In support of H1a, participants were more likely to choose to wait for \$50 in three months instead of \$40 that day (33%) than to wait for \$5 in three months instead of \$4 that day (16%;  $p < .001$ ). Participants choose to wait longer to receive a larger magnitude of money.

Additionally, participants anticipated feeling less patient while waiting three months for \$50 ( $M = 5.06$ ,  $SD = 1.75$ ) than for \$5 ( $M = 5.50$ ,  $SD = 1.97$ ;  $t(111) = 3.04$ ,  $p = .003$ ).

Participants anticipated feeling less patient waiting for a larger magnitude of money.

Finally, participants were willing to pay more for expedited delivery to eliminate a three month wait for \$50 ( $M = \$5.14$ ,  $SD = 5.17$ ) than for \$5 ( $M = \$0.49$ ,  $SD = 1.30$ ;  $t(92) = 9.27$ ,  $p < .001$ ). Participants paid more to eliminate the wait for a larger magnitude of money.

When making incentive-compatible choices, participants made more patient choices for a larger magnitude of money even though they anticipated feeling less patient while waiting for a larger magnitude of money.

## **Study 2b**

One potential issue with the expedited delivery measure in Study 2a is that participants were constrained by the amount of the bonuses (i.e., they would not pay more than \$5 to receive the \$5 bonus sooner). While the results suggest that participants did not feel *more* patient while waiting for larger magnitudes of money (i.e., they could have paid *less* to receive \$50 sooner than to receive \$5 sooner), Study 2b addressed this concern by using different quality mugs

instead of different bonus amounts. Participants could pay up to \$50 to eliminate the wait and were not restricted by the value of the mugs.

**Methods.** We opened the survey to 150 US participants on Prolific Academic in exchange for \$0.45. Prolific returned 151 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 146 participants (72 women;  $M_{\text{age}} = 33.89$ ,  $SD_{\text{age}} = 12.56$ ).

We used a 3 (Patience Measure: patient choice vs. patient experience vs. expedited delivery)  $\times$  2 (Mug Quality: high vs. low) mixed-participants design, where Patience Measure was between-subjects and Mug was within-subjects.

Participants answered questions about two different quality mugs amounts in a counter-balanced order: a higher quality Yeti mug (market value \$30) and a lower quality enamel mug (market value \$4). Participants answered different questions about each of the mugs depending on their condition. Participants in the patient-choice condition made two dichotomous choices: (a) between one high quality mug immediately and two high quality mugs in six months, and (b) between one low quality mug immediately and two low quality mugs in six months. Participants in the patient experience condition rated how impatient they would feel and how hard it would be to wait six months for the mugs (1 = not at all, 7 = very; reverse-coded). We averaged these measures into a patient experience index (2 items;  $r_{\text{high}} = .764$ ,  $r_{\text{low}} = .893$ ). Participants in the expedited delivery condition rated how much they were willing to pay to eliminate a six month wait for two mugs (\$0 to \$50).

**Results and Discussion.** In support of H1a, participants were more likely to wait for two high quality mugs (vs. receive one mug sooner; 76%) than for two low quality mugs (vs. receive

one mug sooner; 24%;  $p < .001$ ). Participants were more likely to wait longer for higher quality mugs.

Additionally, participants anticipated feeling less patient when waiting for high quality mugs ( $M = 4.23$ ,  $SD = 1.80$ ) than low quality mugs ( $M = 5.24$ ,  $SD = 1.88$ ;  $t(49) = 3.72$ ,  $p = .001$ ). Participants anticipated feeling less patient waiting for two higher quality mugs.

Finally, participants were willing to pay more for expedited delivery for two high quality mugs ( $M = \$14.36$ ,  $SD = 14.72$ ) compared to two low quality mugs ( $M = \$4.28$ ,  $SD = 4.48$ ;  $t(49) = 5.67$ ,  $p < .001$ ). Participants paid more money to eliminate the wait for two higher quality mugs.

Study 2b extended our findings to consumer products. Participants made more patient choices for higher quality mugs than lower quality mugs, even though they anticipated feeling less patient while waiting and were willing to pay more to eliminate the wait for the higher quality mugs.

Additionally, when participants could state any amount for expedited delivery (e.g., when they were not constrained by amount of the bonus reward), they were still willing to pay more to eliminate the wait for the higher quality product. This suggests that participants were not savoring the wait for the higher quality product more.

Overall, Study 2 found that consumers make more patient choices for more valuable incentive-compatible bonus amounts and products despite feeling more impatient while waiting for more valuable bonus amounts and products.

### **Study 3: Patient Experience and Choice for Products**

If the value of the rewards has opposite effect on patient experience and choice, it is unlikely that patient experience fully explains patient choice for more valuable rewards. Instead,



we predicted that the increase in the desire to get more valuable products would mediate the effect on choice. To test this underlying process (H1b), in Study 3, we manipulated the value of the rewards and measure patient choice, patient experience, and the desire for the product. We predicted that the desire for the product would mediate the effect of value on choice. We preregistered Study 3 at [https://aspredicted.org/SBL\\_NL7](https://aspredicted.org/SBL_NL7).

## Methods

We opened the survey to 300 US participants on Prolific Academic in exchange for \$0.45. Prolific returned 301 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 299 participants (149 women;  $M_{\text{age}} = 36.34$ ,  $SD_{\text{age}} = 13.18$ ).

We used a 2-condition (Mug Quality: high vs. low) within-participants design. Participants answered questions about two different quality mugs amounts in a counterbalanced order: a higher quality Yeti mug and a lower quality enamel mug. We described the high-quality mug as a “well-insulated” mug that keeps hot drinks hot and cold drinks cold, while the low-quality mug “absorbs heat into the material, which can cool a hot drink and make the mug hot to touch.” We did not list the prices of the mugs.

Participants answered three questions about both types of mugs. As a measure of patient choice, participants rated how likely they were to wait six months for two of the mugs, instead of receiving one mug this week (1 = not at all likely to wait, 7 = very likely to wait).

As a measure of the experience of patience, participants rated how impatient they would feel and how hard it would be to wait six months for two mugs (1 = not at all, 7 = very; reverse-coded). We averaged these measures into a patient experience index (2 items;  $r_{\text{high}} = .854$ ,  $r_{\text{low}} = .825$ ).

As a measure of participants' desire for the mugs, participants rated how much they would be willing to pay for two mugs (\$0 to \$100). While in Study 2b participants rated how much they were willing to pay to eliminate the wait for the mugs (expedited delivery) as an indirect measure of the experience of impatience, in Study 3 participants instead rated how much they were willing to pay to receive the mugs as a measure of their desire for the mugs.

## **Results and Discussion**

In support of H1a, participants were more likely to wait for two high quality mugs (vs. receive one high quality mug sooner;  $M = 4.29$ ,  $SD = 2.42$ ) than for two low quality mugs (vs. receive one low quality mug sooner;  $M = 3.39$ ,  $SD = 2.50$ ;  $t(298) = 4.81$ ,  $p < .001$ ). Participants choose to wait longer to receive two higher quality mugs.

Additionally, participants anticipated feeling less patient when waiting for high quality mugs ( $M = 3.92$ ,  $SD = 1.95$ ) than low quality mugs ( $M = 5.44$ ,  $SD = 1.97$ ;  $t(298) = 13.36$ ,  $p < .001$ ). Participants anticipated feeling less patient waiting for two higher quality mugs.

We further found a significant interaction between patient choices and experiences ( $F(1, 298) = 152.90$ ,  $p < .001$ ). Participants made more patient choices for higher quality mugs, but felt less patient waiting for higher quality mugs. There was also a main effect of Mug Quality ( $F(1, 298) = 6.69$ ,  $p < .001$ ), where participants were more patient overall (across experience and choice) for the lower quality mug, and a main effect of the Patience Measure ( $F(1, 298) = 47.39$ ,  $p < .001$ ), reflecting higher ratings on the experience scale than the choice scale. We did not have predictions about these main effects.

Finally, participants were willing to pay more for two high quality mugs ( $M = \$24.36$ ,  $SD = 13.12$ ) than for two low quality mugs ( $M = \$8.58$ ,  $SD = 6.56$ ;  $t(296) = 25.23$ ,  $p < .001$ ). Participants desired the higher quality mugs more. In support of H1b, willingness to pay

mediated the effect of mug quality on the likelihood of waiting (using Model 1 of SPSS Macro MEMORE with 10,000 samples; Montoya, 2019; indirect effect = 0.89, SE = 0.34, 95% CI = [0.18, 1.53]). Because the experience of patience was lower for the higher-quality mugs, it could not account for the effect of mug quality on patient choice.

In Study 3 participants were more likely to choose to wait for a higher quality mug, despite that it was harder to do so. Additionally, participants wanted the high-quality mug more than the low-quality mug, and their desire for the mugs mediated the effect of quality on the decision to wait. Overall, participants' choice to wait for the higher-quality mugs more was influenced by the desirability of the mug rather than by their experience of patience.

#### **Study 4: Patient Experience and Choice When Hungry**

Does value always have opposite effects on the decision to wait and the experience of waiting? Here we explore one boundary condition. When the increase in value results from an increase in need (e.g., feeling hungry), people will experience greater impatience and, as a result, will make more impatient decisions.

Moving beyond objective value, we ask what causes consumers to value a product more. We distinguish between two potential causes: liking and needing. When a reward is valuable because the person likes it more, the desire for the reward predicts decision-making more than the experience of waiting. Thus, consumers will make *more* patient choices in situations even though they anticipate feeling less patient while waiting. However, when a reward is valuable because it is needed more, consumers will be less likely to wait in situations where it is harder to wait. Thus, consumers will make *less* patient choices when they anticipate feeling less patient while waiting.

To test this hypothesis, Study 4 measured participants' patience for foods in addition to their hunger (i.e., need for the food) and liking of the food. We predicted that for foods that participants like more, they would feel less patient but make more patient decisions. Specifically, participants would choose to wait for a larger portion (vs. receive a smaller portion of food sooner) but report feeling less patient waiting. That is, liking a food more would lead to more patient choices, but less patient experiences waiting (H1a).

We further predicted that hungrier participants would feel less patient and make less patient decisions. Specifically, participants would be less likely to choose to wait for a larger portion of food (vs. receive a smaller portion of food sooner) and would feel less patient waiting for foods. That is, hunger would lead to less patient choices and less patient experiences waiting (H2a).

## **Methods**

We opened the survey to 100 US participants on Prolific Academic in exchange for \$0.95. Prolific returned 103 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 103 participants (72 women;  $M_{\text{age}} = 31.02$ ,  $SD_{\text{age}} = 12.06$ ).

Participants first rated how hungry they felt (1 = not at all; 7 = very). Then participants answered questions about four different foods in a counter-balanced order: an egg salad sandwich, pineapple pizza, broccoli cheddar soup, and pumpkin pie. We chose to use these foods because we anticipated that people would vary in how much they like them.

For each food, participants reported both their likelihood of waiting (patient choice) and experience waiting (patient experience). Specifically, participants rated how likely there were to wait two hours for a whole portion of the food instead of receiving a smaller portion sooner (e.g.,

a whole egg salad sandwich in two hours or a half of an egg salad sandwich now, a whole bowl of broccoli cheddar soup in two hours or a miniature cup of broccoli cheddar soup now, etc.).

To measure patient experiences, participants rated (a) how impatient they would feel waiting, (b) how much they feel like they can't wait, and (c) how hard it would be for them to wait two hours for a whole portion of the food (1 = not at all; 7 = very; reverse-coded). We averaged these items into a patient experience index (3 items; for the four foods,  $as > .860$ ). Finally, participants rated how much they like each food (1 = not at all; 7 = very much). In this study only, we collected additional exploratory variables, which are reported on OSF.

## **Results and Discussion**

Means and standard deviations are reported in Table 3.3. In support of H1a, participants' liking of the food positively predicted their likelihood of waiting for the larger-later option (for the four foods,  $bs > 0.26$ ,  $ps < .05$ ), but negatively predicted their anticipated experience of patience (for the four foods,  $bs < -0.24$ ,  $ps < .01$ ). That is, when participants liked the foods more, they made more patient choices, even though they anticipated feeling less patient waiting.

Additionally, in support of H2a, participants' hunger ( $M = 3.03$ ,  $SD = 1.70$ ) negatively predicted their likelihood of waiting for the larger-later option (for three of the foods,  $bs > -0.20$ ,  $ps < .05$ ) and their anticipated experience of patience (for three of the foods,  $bs > -0.36$ ,  $ps < .001$ ). That is, when participants needed food more, they made less patient choices and anticipated feeling less patient waiting. The results were consistent for all foods, except for pumpkin pie (see Table 3.4).

Overall, participants made more patient choices about foods that they liked more, even though they anticipated feeling less patient while waiting for foods that they liked more. Moving from objective value (in Studies 1-3) to subjective value here, we again find opposite effects on

experience and choice. We further find that participants made less patient choices when they needed the food more (i.e., were hungrier) and felt less patient waiting when they needed the foods more. Stronger need had a similar influence on the experience of patience and the decision to be patient.

### **Study 5: Patient Experience and Choice for Needs**

Study 5 measured patience for a variety of consumer products. We predicted that participants would be more likely to wait for a better version of a high quality product (instead of receiving a worse version of the high quality product sooner) than to wait for a better version of a low quality product (instead of receiving a worse version of the low quality product sooner). For example, participants would be more likely to wait for a two-night vacation than receive a one-night vacation sooner when the vacation was at a 5-star luxury resort compared to a 3-star hotel. However, we also predicted that participants would feel less patient when waiting for high quality products than low quality products. Participants would feel more impatient waiting for a two-night vacation at a 5-star luxury resort than a 3-star hotel. Thus, participants would make more patient choices about more valuable rewards, even though they anticipate feeling less patient waiting for these rewards (H1a).

Further, we tested the process underlying the effect. We predicted that when a reward is valuable because it is higher quality, the desire for the reward will mediate decision-making (H1b). Thus, consumers make more patient choices for higher quality products, despite that they are harder to wait for, because they desire the higher quality products more.

Additionally, we tested the boundary condition of when value is the result of greater need. When participants needed the rewards more, we predicted that they would make less patient choices in situations where they anticipated feeling less patient waiting (H2a).

Specifically, we predicted that participants would make less patient choices about products that they need a lot than products that they need a little and would feel less patient while waiting for products that they need a lot than products that they need a little.

Further, we predicted that when a reward is valuable because it is needed more, the anticipated experience waiting will mediate the decision to wait (H2b). That is, consumers make less patient choices for products that they need more, despite that they are more desirable, because more needed products are harder to wait for. We preregistered Study 5 at [https://aspredicted.org/QCM\\_465](https://aspredicted.org/QCM_465).

## Methods

**Participants.** We opened the survey to 200 US participants on Prolific Academic in exchange for \$0.75. Prolific returned 201 respondents. We analyzed responses only from participants who passed a bot check, resulting in a final sample of 200 participants (100 women;  $M_{\text{age}} = 36.44$ ,  $SD_{\text{age}} = 12.69$ ).

**Procedure.** We used a 2 (Value: quality vs. need)  $\times$  2 (Amount: high vs. low) mixed-design, where Value was between-subjects and Amount was within-subjects. Specifically, participants made choices about consumer products. We manipulated whether the product was valuable because of its quality or because it satisfies a need. In the quality condition, participants rated both a high-quality and a low-quality version of the product. In the need condition, participants instead rated both a product that they were told they need a lot and or need a little.

As the measures of patience, participants rated how likely they would be to wait for the larger-later option as opposed to receiving a smaller-sooner option (1 = not at all, 7 = very; patient choice) and how impatient they would feel waiting for the larger-later option (1 = not at

all, 7 = very; reverse-coded; patient experience). Participants made these ratings for three different products in a counter-balanced order: a smartwatch, ice cream, and a vacation.

For example, participants made choices about how likely they would be to wait six months for a newer model of a smartwatch instead of receiving an older model immediately (patient choice) and how impatient they would feel waiting six months for a newer smartwatch model (patient experience). In the quality condition, participants answered this question for both an expensive, high quality smartwatch brand and a cheap, low quality smartwatch brand. In the need condition, participants instead answered this question about both when they need the smartwatch a lot and when they need it a little.

We also measured participants' desire for the products. Specifically, participants rated how much they would be willing to pay for the newest smartwatch model with advanced features (\$0 to \$500), a regular pint of ice cream (\$0 to \$50), and a two-night vacation (\$0 to \$1,000).

## **Results and Discussion**

Means and standard deviations are reported in Table 3.5. First, we compared participants' patience in the quality condition. In support of H1a, participants were more likely to choose to wait for the larger-later option for high quality products than for low quality products (for the three product pairs,  $t_s > 8.90$ ,  $p_s < .001$ ). That is, participants made more patient choices about higher quality products. Additionally, participants anticipated feeling less patient waiting six months for high quality products than for low quality products (for the three product pairs,  $t_s < -4.60$ ,  $p_s < .001$ ).

Accordingly, across all products, we found a significant interaction between patient choices and experiences ( $F(1, 104) = 172.95$ ,  $p < .001$ ). Participants made more patient choices about higher quality products despite feeling less patient waiting for higher quality products. We



also found a significant main effect of Value ( $F(1, 104) = 26.06, p < .001$ ), where participants were more patient overall (across experience and choice) for higher quality rewards. There was no significant main effect based on the patience measure ( $p = .239$ ). We did not have predictions about these main effects.

Further, participants were willing to pay more for higher quality products compared to lower quality products (for the three product pairs,  $ts < 10.39, ps < .001$ ). Participants desired the higher quality products more. In support of H1b, the desire for the products mediated the effect of product quality on the likelihood of waiting (using Model 1 of SPSS Macro MEMORE with 10,000 samples; Montoya, 2019; indirect effect = 0.92, SE = 0.32, 95% CI = [0.28, 1.55]). The desire for the reward mediated patient choices for more valuable rewards.

Next, we compared participants' patience in the need condition. In support of H2a, participants were less likely to wait for the larger-later option for products they needed more than for products they needed less (for the three product pairs,  $ts < -5.72, ps < .001$ ). That is, participants made less patient choices about products that they needed more. Additionally, participants anticipated feeling less patient waiting six months for products that they needed more than products they needed less (for the three product pairs,  $ts < -9.70, ps < .001$ ). Participants both felt less patient and made less patient choices for products they needed more.

Accordingly, across all products, we found a significant three-way interaction between patience (experience vs. choice), the type of value (quality vs. need), and the strength of the value (high vs. low;  $F(1, 198) = 98.38, p < .001$ ). Patient experiences and choices diverged when products were valuable because they were higher quality, but were consistent for when products were valuable because they were needed more (see Figure 3.2).

Further, participants were willing to pay more for the products when they needed them more compared to when they needed the rewards less (for the three product pairs,  $t_s < 10.18$ ,  $p_s < .001$ ). Participants had a stronger desire for the products they needed more. However, in support of H2b, the experience waiting for the products mediated the effect of product need on the likelihood of waiting (using Model 1 of SPSS Macro MEMORE with 10,000 samples; Montoya, 2019; indirect effect = -1.50, SE = 0.20, 95% CI = [-1.91, -1.10]), rather than the desire for the products. When a reward was valuable because it was needed more, the experience of waiting mediated patient choice.

Overall, for higher quality products, participants made more patient choices even though they anticipated feeling less patient while waiting. Patient decision-making was *inconsistent* with patient experiences. Further, the desire for the reward mediated the decision to wait. Participants were more likely to wait for higher quality rewards, despite that it was more difficult to do so, because they desired the rewards more.

However, when the reason why the product was valuable was because it was needed more, rather than because it was higher quality, participants made less patient choices and felt less patient waiting. For needs, patient decision-making was instead *consistent* with patient experiences. Thus, the relationship between patient experience and choice depends on whether people are making choices about outcomes that they need. When the rewards were valuable because participants needed them more, they were less likely to wait when it was harder to do so. The experience of waiting, rather than the desire for the reward, mediated the decision to wait for needs.

## **The Relationship Between Patient Experience and Choice**

In Studies 3-5 we could also analyze the correlations between patient experience and choice because the same participants rated both measures. We find that, as expected, these measures are positively correlated most of the time (Study 3:  $r_{high} = .291$ ,  $p_{high} < .001$ ,  $r_{low} = .250$ ,  $p_{low} < .001$ ; Study 4:  $r = .527$ ,  $p < .001$ ; Study 5:  $r_{high} = .408$ ,  $p_{high} < .001$ ,  $r_{low} = .026$ ,  $p_{low} = .716$ ). These results suggest that participants were less likely to wait when they found it harder to do so.

While the value of a reward has opposite effects on patient experience and choice, these variables are positively correlated. This suggests that the decision to wait is usually partially informed by the anticipated experience waiting. Yet, the experience waiting does not explain the effect of reward value on choice. This effect is instead driven by the desire for the reward.

## **General Discussion**

Impatient consumers can behave patiently. When waiting for more valuable rewards, participants made more patient choices despite anticipating feeling less patient while waiting. We documented this effect for intertemporal choices between different values of monetary rewards and different quality consumer products (e.g., a luxury resort vs. a standard hotel). The effect of reward value on patience was driven by the desire for the reward more than the difficulty of waiting. We also identified an important boundary condition. When a reward was valuable because it was needed, the strength of the need had similar effect on patient choices and experiences. We found that hungrier (vs. less hungry) participants and participants who needed a product more (vs. less) were both less likely to wait and felt less patient about waiting. The effect of need on patient decision-making was mediated by the experience of patience rather than the desire for the rewards.

These findings have important implications for how researchers conceptualize patience. When waiting for more valuable rewards, we find that patient experiences and choices diverge. However, patience as an experience and a choice are often discussed interchangeably. For example, while researchers might say that people are more “patient” for larger magnitudes of money, the magnitude effect (Thaler, 1981) only applies to the decision to wait. Indeed, we find that people anticipate feeling less patient when waiting for larger magnitudes of money. Whether a person is more patient for larger magnitudes of money depends on whether researchers define patience as an experience or a choice.

While we find that people are more likely to wait in situations where it is harder to do so, we do not claim that they wait *because* it is harder to do so. That is, we find people are more likely to wait for more valuable rewards because they desire them more, despite that they are harder to wait for. The relationship between the two measures of patience—patient choice and experience—is generally positive. When people feel patient, they make patient decisions. What we find is that the value of the reward has opposite effects on these measures, and that for more valuable rewards, it’s the desire for the reward rather than the experience of discomfort that underlies choice.

Our findings change how we think about consumers who are choosing to wait. Just because consumers are willing to wait, does not mean it is a positive experience for them. For example, consumers who like a product may be more likely to wait even if they feel more annoyed about waiting. When marketers announce a wait for a product, it may be that the consumers who are most likely to wait for the product are also the most frustrated about waiting. Because they value the product a lot, it is also harder for them to wait. Thus, there may be

advantages to offering fans of a product the opportunity to receive it sooner, as they may feel more impatient about waiting than people who value the product less.

Additionally, our findings have implications for designing interventions to improve patience. While interventions often strive to make waiting easier, this may not always lead to more patient choices. In some situations, consumers are willing to wait even though waiting is harder. Therefore, increasing the desirability of a reward may be a more effective strategy for improving patience in some cases, even if it makes the rewards harder to wait for. For example, consumers may be more likely to wait for the newest smartphone model when it is described as “lightning fast with pristine photo quality” (vs. just another upgrade). Highlighting the attractiveness of the reward can increase patience even if it makes it harder to wait for the reward.

### **Directions for Future Research**

Throughout our studies, we measure the anticipated experience of patience. However, future research could explore how consumers *actually feel* while they wait. It may be that waiting for more valuable rewards is not any harder than waiting for less valuable rewards, despite what consumers anticipate. Indeed, consumers may engage in self-control tactics to make the wait more manageable (Myrseth et al., 2009) or may forget about the wait entirely. We only explore the anticipated experience of patience because it is more relevant for decision-making than the experience after the intertemporal choice. Presumably, how consumers feel after they made the choice cannot influence that choice. Yet, it is still interesting to understand whether the anticipated experience of waiting reflects reality.

We find that the same factor that leads consumers to act patient can lead them to feel impatient. While much research has explored what leads consumers to make patient decisions,

less is known about what leads them to feel patient while waiting. Research on intertemporal choice found that a sense of connection with future self (Ersner-Hershfield et al., 2009; Bartels & Urminsky, 2011), abstract construal level (Fujita et al., 2006), resource slack (Zauberman & Lynch, 2005), and more, all lead to more patient decision-making. How do these factors influence the experience of patience? While they might lead to more patient experiences, it is also possible that they could make consumers feel less patient while waiting, despite leading to more patient choices. For example, consumers may anticipate feeling less patient waiting when they are more connected to their future self, because they are more aware of the pain their future self will experience while they wait. Thus, a stronger connection to the future self could lead to more patient choices but less patient experiences.

Additionally, we find that the discrepancy between patient experience and choice for more valuable rewards is attenuated when the reward is valuable because it is needed more. The distinction between valuable rewards and needed rewards relates to research on necessities and luxuries (Bearden & Etzel, 1982; Kivetz & Simonson, 2002), as necessities are perceived as essential while other types of value are nonessential indulgences. Thus, patient experience and choice may be more likely to diverge for products considered to be luxuries (e.g., a vacation, fancy food, an expensive watch) than necessities (e.g., savings, ordinary food, medical care). Additionally, framing the same reward as either a luxury or a necessity could change the impact of the value of the reward on impatience. For example, the same features of a smartwatch that make it higher quality could be perceived as features that make it more necessary to have. Yet, framing these features as a luxury (vs. a necessity) could impact whether consumers will be more patient or less patient to wait to receive them.

## **Conclusion**

Consumers make more patient choices for more valuable rewards, despite feeling less patient waiting for more valuable rewards. This is because the value of the rewards increases consumers' desire to wait, rather than because consumers enjoy waiting for more valuable rewards. Consumers are willing to wait for more valuable rewards, despite that they think it will be harder to do so, because their desire for the reward makes the wait worthwhile. Yet, the reason why a reward is valuable matters. When rewards are valuable because they are needed more, the experience of waiting instead predicts the decision to wait, and patient choices and experiences no longer diverge.

## Appendix 1: Tables

**Table 1.1: Summary of Studies, Chapter 1**

<b>Study</b>	<b>Independent Variable</b>	<b>Primary Measures</b>	<b>Main Finding</b>
<b>1</b>	Self-reported liking of the target	Likelihood of waiting for larger quantity or better quality target	Liking was positively correlated with patience
<b>2a</b>	1st vs. 5th favorite t-shirt	Likelihood of waiting for correct size t-shirt (vs. one size too large)	Liking increased patience for a correct size t-shirt
<b>2b</b>	1st vs. 5th favorite bed comforter	Likelihood of waiting for correct size bed comforter (vs. one size too large)	Liking increased patience for a correct size bed comforter
<b>2c</b>	1st vs. 5th favorite mug	Likelihood of waiting for standard size mug (vs. non-standard small size)	Liking increased patience for a standard size mug
<b>3</b>	More vs. less popular t-shirt	Choice to wait for correct size t-shirt (vs. one size too large)	Liking increased patience for a correct size t-shirt
<b>4</b>	Favorite food or drink vs. type they would consume, but is not their favorite	Choice to wait for a whole portion of food or drink item (vs. sample size)	Liking increased patience for a larger quantity of food and drink items
<b>5</b>	More vs. less popular water bottle	Likelihood of waiting for the standard size water bottle (vs. non-standard small size) and subjective value (WTP) of the standard size water bottle (vs. non-standard small size)	Liking increased the difference in subjective value (WTP) between the standard and smaller size water bottles, which mediated the effect of liking on patience for the standard size water bottle
<b>6</b>	More vs. less popular water bottle	Choice to wait for the standard size water bottle (vs. non-standard small size) and pay \$1 for expedited delivery of the standard size water bottle	Liking increased (1) willingness to wait for a standard size water bottle and (2) willingness to pay \$1 for expedited delivery



**Table 1.2: Participant Attrition, Chapter 1**

Condition	Dropouts	Percentage
<b>Study 1 (N = 400)</b>		
Quantity	0	0.00%
Quality	1	0.25%
<b>Study 2a (N = 400)</b>		
High liking	2	0.50%
Low liking	2	0.50%
<b>Study 2b (N = 400)</b>		
High liking	3	0.75%
Low liking	4	1.00%
<b>Study 2c (N = 408)</b>		
High liking	6	1.47%
Low liking	8	2.96%
<b>Study 3 (N = 206)</b>		
High liking	0	0.00%
Low liking	0	0.00%
<b>Study 4 (N = 302)</b>		
High liking	4	1.32%
Low liking	7	2.32%
<b>Study 5 (N = 258)</b>		
High liking	0	0.00%
Low liking	0	0.00%
<b>Study 6 (N = 400)</b>		
High liking	3	0.75%
Low liking	5	1.25%

*Note.* Dropouts were not counted toward reported sample sizes.

**Table 1.3: Scenarios from Study 1, Chapter 1**

<b>Domain</b>	<b>Quantity</b>	<b>Quality</b>
Exercise	Consider two promotion offers for free exercise classes (e.g. yoga, spinning, weight lifting, etc.): (a.) One for one exercise class that you can redeem next week (b.) One for three exercise classes that you can only redeem once you wait one month. How likely are you to wait one month so that you can take three exercise classes (option b)?	Consider two promotion offers for a free exercise class (e.g. yoga, spinning, weight lifting, etc.): (a.) One for a class with an instructor that has mediocre ratings that you can redeem next week (b.) One for a class with an instructor that has excellent ratings that you can only redeem if you wait one month. How likely are you to wait one month so that you can take the exercise class with an instructor with excellent ratings (option b)?
Vacation	Consider two potential beach vacations that have same weather and price: (a.) One for two days this weekend (b.) One for three days where you need to wait one month for a long weekend. How likely are you to wait one month so that you can take a three-day beach vacation (option b)?	Consider two potential beach vacations that are the same price: (a.) One this weekend with mediocre weather (b.) One where you need to wait one month with better beach conditions and warmer weather. How likely are you to wait one month for better weather on the beach vacation (option b)?
Broadway	Consider two promotions for free pairs of tickets to Broadway shows: (a.) One for one show that you can redeem this weekend (b.) One for two different shows that you can only redeem if you wait six months. How likely are you to wait six months for the two Broadway shows (option b)?	Consider two promotions for a free pair of tickets to a Broadway show: (a.) One for back row seats that you can redeem this weekend (b.) One for front row seats that you can only redeem if you wait six months. How likely are you to wait six months for the front row seats (option b)?
Chipotle	Consider two promotions for free meals (e.g. burrito, taco, etc.) at Chipotle: (a.) One for one free meal that you can redeem next week (b.) One for two free meals that you can only redeem if you wait one month. How likely are you to wait one month for two meals at Chipotle (option b)?	Consider ordering at Chipotle if they have run out of your favorite ingredients: (a.) You can order now and select ingredients you like less (b.) You can wait 15 minutes for the ingredients to be restocked and order your favorite ingredients. How likely are you to wait 15 minutes for your favorite ingredients (option b)?
Seafood	Consider two promotions for free meals at a seafood restaurant: (a.) One for one free meal that you can redeem next weekend (b.) One for two free meals that you can only redeem if you wait one month. How likely are you to wait one month for two meals at the seafood restaurant (option b)?	Consider two promotions for free meals at a seafood restaurant: (a.) One with a limited menu that you can redeem next week (b.) One with a full menu that you can only redeem if you wait one month. How likely are you to wait one month to order from the full menu (option b)?

**Table 1.4: Results from Study 1, Chapter 1**

Means and correlations for liking and patience by condition and domain (Study 1)

<b>Condition</b>	<b>Domain</b>	<b><i>n</i></b>	<b>Liking means</b>	<b>Patience means</b>	<b><i>r</i> (Liking, Patience)</b>	<b><i>p</i></b>
Quantity	Vacation	173	2.43 (0.94)	2.06 (1.45)	<b>.278</b>	.000
	Chipotle	161	1.96 (1.03)	1.40 (1.90)	<b>.235</b>	.003
	Seafood	132	2.30 (0.95)	1.68 (1.72)	<b>.208</b>	.017
	Broadway	86	1.84 (1.02)	1.10 (1.97)	<b>.415</b>	.000
	Exercise	79	1.84 (1.08)	1.11 (1.93)	<b>.262</b>	.020
	Total	200	1.56 (1.79)	2.13 (1.02)	<b>.305</b>	.000
Quality	Vacation	160	2.36 (0.92)	2.41 (1.04)	<b>.252</b>	.001
	Chipotle	156	1.83 (1.05)	1.33 (1.79)	<b>.243</b>	.002
	Seafood	143	2.19 (0.87)	1.41 (1.75)	<b>.291</b>	.000
	Broadway	89	2.06 (0.98)	1.45 (1.90)	<b>.127</b>	.236
	Exercise	76	1.63 (1.27)	1.68 (1.59)	<b>.199</b>	.085
	Total	200	1.68 (1.67)	2.05 (1.02)	<b>.249</b>	.000

*Note.* Standard deviations are in parentheses.

**Table 1.5: Results from Study 2, Chapter 1**

Means and test statistics for liking and patience ratings by condition (Study 2).

<b>Variable</b>	<b>Study</b>	<b>High liking</b>	<b>Low liking</b>	<b><i>t</i>-test</b>
<b>Likelihood of waiting</b>	Study 2a	5.05 (2.08)	4.44 (2.24)	$t(398) = 2.80, p = .005$
	Study 2b	4.68 (2.20)	3.77 (2.30)	$t(398) = 4.02, p < .001$
	Study 2c	5.07 (2.02)	4.31 (2.17)	$t(406) = 3.65, p < .001$
<b>Manipulation check</b>	Study 2a	2.30 (0.76)	1.03 (1.31)	$t(398) = 11.82, p < .001$
	Study 2b	2.21 (0.89)	0.92 (1.38)	$t(398) = 11.15, p < .001$
	Study 2c	2.25 (1.00)	0.82 (1.23)	$t(406) = 12.77, p < .001$

*Note.* Standard deviations are in parentheses.

**Table 1.6: Results from Study 4, Chapter 1**

Means and test statistics for liking and patience ratings by condition and item (Study 4).

<b>Variable</b>	<b>Item</b>	<b><i>n</i></b>	<b>High liking</b>	<b>Low liking</b>	<b><i>t</i> / <i>X</i><sup>2</sup></b>	<b><i>p</i></b>
<b>Percent choosing to wait</b>	Cheese	269	84.6%	58.6%	22.27	<.001
	Chocolate	269	70.3%	43.5%	19.69	<.001
	Breakfast cereal	233	84.3%	60.4%	16.86	<.001
	Coffee	209	67.6%	50.0%	6.70	.010
	Granola bar	184	79.3%	53.3%	14.01	<.001
	Beer	144	88.1%	70.1%	6.82	.009
<b>Manipulation check</b>	Cheese	269	2.64 (0.59)	0.71 (1.44)	14.41	<.001
	Chocolate	269	2.64 (0.62)	0.60 (1.41)	15.55	<.001
	Breakfast cereal	233	2.43 (0.76)	0.89 (1.25)	11.53	<.001
	Coffee	209	2.48 (0.90)	0.44 (1.49)	11.94	<.001
	Granola bar	184	2.33 (0.85)	0.46 (1.41)	10.88	<.001
	Beer	144	2.49 (0.68)	0.71 (1.41)	9.39	<.001

*Note.* Percentages represent the proportion of participants choosing to wait for a whole portion. Means reflect raw means. Standard deviations are in parentheses.

**Table 2.1: Summary of Studies, Chapter 2**

<b>Study</b>	<b>Main Finding</b>	<b>Statistics</b>	<b>High desire for closure</b>	<b>Low desire for closure</b>
<b>1</b>	Participants chose to pay more money sooner (vs. less later) for the last service more than the first service.	$X^2(1, N = 194) = 4.29, p = .038$	51%	36%
<b>2</b>	Participants chose to pay more money sooner (vs. less later) for the last item on their shopping list more than for an item in the middle of their list. The desire for goal closure mediated the effect.	$X^2(1, N = 147) = 7.27, p = .007$	66%	44%
<b>3</b>	Participants chose to complete more work sooner (vs. less later) in a transcription task when it allowed them to complete the task earlier more than when it did not.	$X^2(2, N = 301) = 61.56, p < .001$	65%	21% and 18%
<b>4</b>	Participants chose to complete more work sooner (vs. less later) in a transcription task when the task was last more than when it was first. The desire for goal closure mediated the effect.	$X^2(1, N = 199) = 4.10, p = .043$	60%	45%
<b>5</b>	Participants chose to complete more work sooner (vs. less later) in a product review task when it was framed as the last part of the main task more than when it was framed as a bonus task. The desire for goal closure mediated the effect.	$X^2(1, N = 200) = 9.68, p = .002$	61%	39%

*Note.* Percentages represent the proportion of participants choosing the costlier-sooner option (to pay or work more sooner instead of less later).

**Table 2.2: Participant Attrition, Chapter 2**

Condition	Dropouts	Percentage
<b>Study 1</b>		
Start	2	0.95%
Finish	0	0.00%
<b>Study 2</b>		
Halfway	1	0.65%
Finish	1	0.65%
<b>Study 3</b>		
Longer task sooner	31	6.72%
Both-sooner	41	8.89%
Both-later	27	5.86%
<b>Study 4</b>		
Start	30	9.80%
Finish	21	6.86%
<b>Study 5</b>		
Final task	2	0.98%
Bonus task	2	0.98%

*Note.* Dropouts were not counted toward reported sample sizes.

**Table 3.1: Summary of Studies, Chapter 3**

<b>Study</b>	<b>Test</b>	<b>Finding</b>
1	Patience for larger (vs. smaller) magnitudes of money	More patient choices for larger magnitudes of money
		Less patient experiences for larger magnitudes of money
		Pay more for expedited delivery for larger magnitudes of money
2a	Incentive-compatible patience for larger (vs. smaller) magnitudes of money	More patient choices for a larger magnitude of money
		Less patient experiences for a larger magnitude of money
		Pay more for expedited delivery for a larger magnitude of money
2b	Patience for high (vs. low) quality mugs	More patient choices for higher quality mugs
		Less patient experiences for higher quality mugs
		Pay more for expedited delivery for a better quality mug
3	Patience for high (vs. low) quality mugs and mediation by desire	More patient choices for higher quality mugs
		Less patient experiences for higher quality mugs
		Desire for the mugs mediates the effect of quality on choice
4	Liking of food	More patient choices for more well-liked food
		Less patient experiences for more well-liked food
	Needing of food (when hungrier)	Less patient choices when hungrier
		Less patient experiences when hungrier
5	Patience for high (vs. low) quality products and mediation by desire	More patient choices for higher quality products
		Less patient experiences for higher quality products
		Desire for the products mediates the effect of quality on choice
	Patience for more (vs. less) needed products and mediation by the experience waiting	Less patient choices for more needed products
		Less patient experiences for more needed products
		Experience waiting mediates the effect of need on choice



**Table 3.2: Participant Attrition, Chapter 3**

Condition	Dropouts	Percentage
<b>Study 1</b>		
Patient choice	0	0.00%
Patient experience	0	0.00%
Expedited delivery	0	0.00%
<b>Study 2a</b>		
Patient choice	0	0.00%
Patient experience	0	0.00%
Expedited delivery	1	0.32%
<b>Study 2b</b>		
Patient choice	0	0.00%
Patient experience	0	0.00%
Expedited delivery	0	0.00%
<b>Study 3</b>		
All participants	1	0.33%
<b>Study 4</b>		
All participants	0	0.00%
<b>Study 5</b>		
Quality	1	0.48%
Need	1	0.48%

*Note.* Dropouts were not counted toward reported sample sizes.

**Table 3.3: Descriptive Statistics from Study 4, Chapter 3**

Descriptive statistics for Study 4. Participants rated their likelihood of waiting for a larger-later option (patient choice), ease of waiting for the larger-later option (patient experience), and liking of four different foods.

<b>Food Item</b>	<b>Patience Choice</b>		<b>Patient Experience</b>		<b>Liking</b>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Egg salad sandwich	4.65	2.40	5.49	1.87	4.01	2.38
Pineapple pizza	4.46	2.48	5.47	1.84	4.05	2.35
Broccoli cheddar soup	4.90	2.30	5.17	1.80	4.84	2.10
Pumpkin pie	5.40	2.16	5.39	1.71	5.13	2.05
<b>Overall</b>	<b>4.85</b>	<b>1.72</b>	<b>5.38</b>	<b>1.38</b>	<b>4.51</b>	<b>1.35</b>

**Table 3.4: Results from Study 4, Chapter 3**

<b>Food Item</b>	<b>Variable</b>	<b>Patient Choice</b>			<b>Patient Experience</b>		
		<i>b</i>	<i>SD</i>	<i>p</i>	<i>b</i>	<i>SD</i>	<i>p</i>
Egg salad sandwich	Hunger	-0.30	0.14	.035	-0.47	0.09	<.001
	Liking	0.29	0.10	.005	-0.33	0.06	<.001
Pineapple pizza	Hunger	-0.28	0.13	.041	-0.39	0.09	<.001
	Liking	0.35	0.10	.001	-0.38	0.06	<.001
Broccoli cheddar soup	Hunger	-0.28	0.14	.044	-0.50	0.09	<.001
	Liking	0.35	0.10	.001	-0.25	0.07	.001
Pumpkin pie	Hunger	-0.16	0.12	.190	-0.14	0.09	.139
	Liking	0.39	0.11	<.001	-0.33	0.08	<.001
<b>Overall</b>	<b>Hunger</b>	<b>-0.21</b>	<b>0.09</b>	<b>.024</b>	<b>-0.37</b>	<b>0.07</b>	<b>&lt;.001</b>
	<b>Liking</b>	<b>0.27</b>	<b>0.11</b>	<b>.014</b>	<b>-0.30</b>	<b>0.09</b>	<b>.001</b>

**Table 3.5: Results from Study 5, Chapter 3**

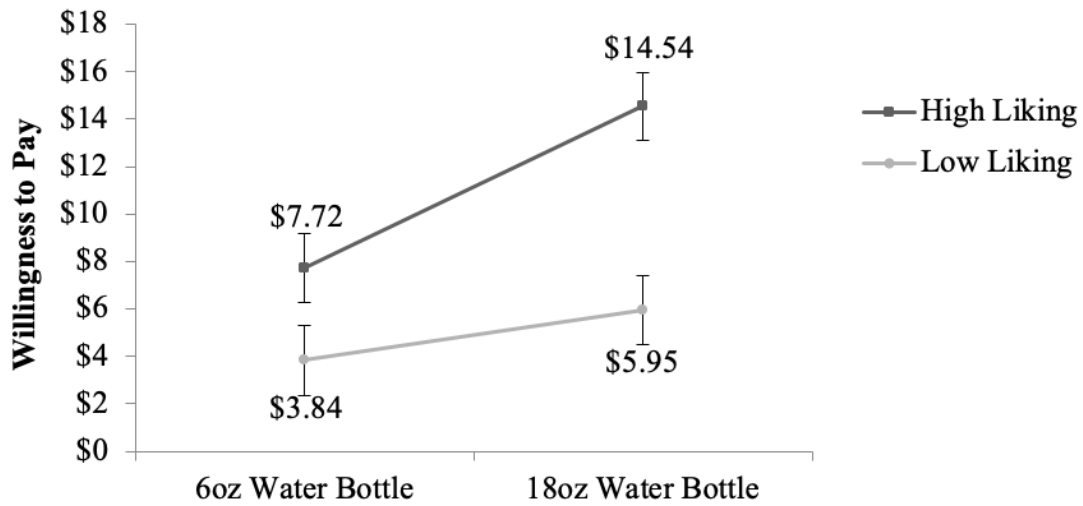
Participants rated their likelihood of waiting for a larger-later option (patient choice), experience waiting for the larger-later option (patient experience), and willingness to pay for the larger option (desire) for three different consumer products. Participants made these ratings for high quality and low quality versions of the product (quality condition) or when they needed the products a lot and a little (need condition).

Condition	Domain	<i>n</i>	High quality		Low quality		t-test	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
<b>Quality</b>								
Choice	Smartwatch	105	5.91	1.47	3.63	2.01	8.92	< .001
	Ice Cream	105	5.47	2.02	3.22	2.17	10.11	< .001
	Vacation	105	6.07	1.51	4.30	1.85	9.22	< .001
	<b>Overall</b>	<b>105</b>	<b>5.82</b>	<b>1.20</b>	<b>3.71</b>	<b>1.38</b>	<b>13.67</b>	<b>&lt; .001</b>
Experience	Smartwatch	105	3.82	2.07	5.10	1.89	-5.18	< .001
	Ice Cream	105	4.52	2.00	5.59	1.90	-4.61	< .001
	Vacation	105	3.63	1.96	4.86	1.52	-7.22	< .001
	<b>Overall</b>	<b>105</b>	<b>3.99</b>	<b>1.48</b>	<b>5.18</b>	<b>1.27</b>	<b>-7.78</b>	<b>&lt; .001</b>
WTP	Smartwatch	105	\$231.76	125.56	\$81.69	71.24	14.14	< .001
	Ice Cream	105	\$9.24	7.24	\$4.24	4.51	10.40	< .001
	Vacation	105	\$440.34	221.87	\$227.73	130.63	14.89	< .001
	<b>Overall</b>	<b>105</b>	<b>\$227.11</b>	<b>97.93</b>	<b>\$104.55</b>	<b>57.08</b>	<b>16.86</b>	<b>&lt; .001</b>
<b>Needs</b>								
Choice	Smartwatch	95	4.61	1.90	5.93	1.57	-5.73	< .001
	Ice Cream	95	3.13	2.18	4.91	2.05	-8.53	< .001
	Vacation	95	3.39	2.14	5.14	1.98	-7.40	< .001
	<b>Overall</b>	<b>95</b>	<b>3.71</b>	<b>1.53</b>	<b>5.32</b>	<b>1.42</b>	<b>-9.96</b>	<b>&lt; .001</b>
Experience	Smartwatch	95	2.99	1.73	4.93	1.77	-10.83	< .001
	Ice Cream	95	2.75	2.00	5.06	1.77	-10.88	< .001
	Vacation	95	2.77	1.75	4.62	1.87	-9.73	< .001
	<b>Overall</b>	<b>95</b>	<b>2.84</b>	<b>1.30</b>	<b>4.87</b>	<b>1.32</b>	<b>-13.69</b>	<b>&lt; .001</b>
WTP	Smartwatch	95	\$225.32	122.45	\$157.89	102.71	10.30	< .001
	Ice Cream	95	\$6.80	4.73	\$4.43	3.49	10.19	< .001
	Vacation	95	\$403.03	216.28	\$264.76	158.73	10.35	< .001
	<b>Overall</b>	<b>95</b>	<b>\$211.72</b>	<b>102.72</b>	<b>\$142.36</b>	<b>78.62</b>	<b>11.50</b>	<b>&lt; .001</b>

## Appendix 2: Figures

**Figure 1.1: Results from Study 5, Chapter 1**

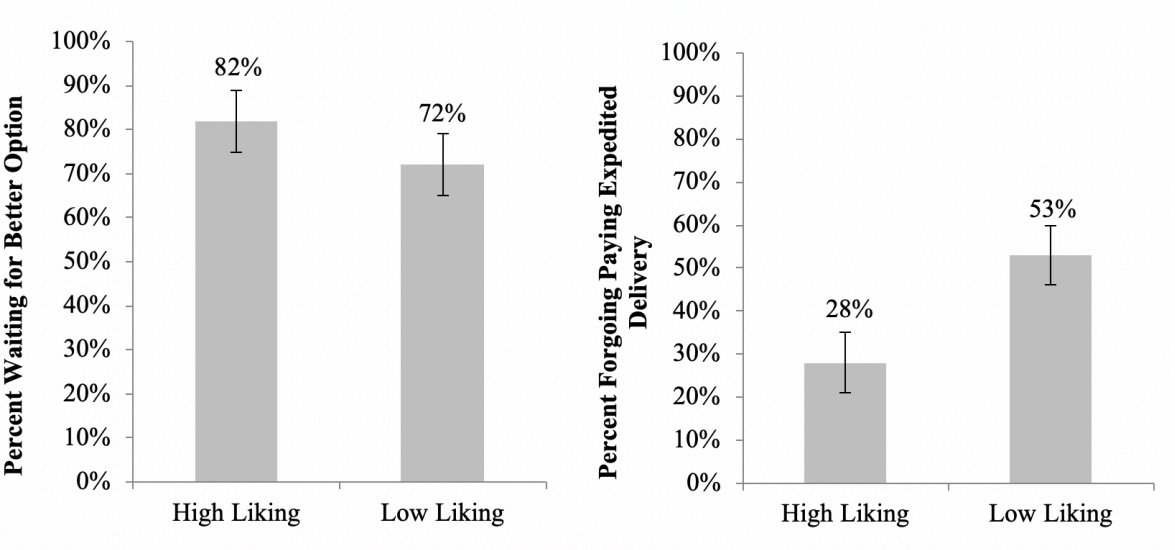
Willingness to pay for the 6oz water bottle (smaller reward) and the 18oz water bottle (larger reward) by liking condition. Liking increased the difference in subjective value between the smaller and larger rewards (Study 5).



*Note.* Error bars represent 95% confidence intervals.

**Figure 1.2: Results from Study 6, Chapter 1**

Percent of participants choosing to wait in the time-value dilemma (left panel) and in the time-cost dilemma (right panel). Liking increased patience for the better option, but decreased patience in forgoing expedited delivery (Study 6).

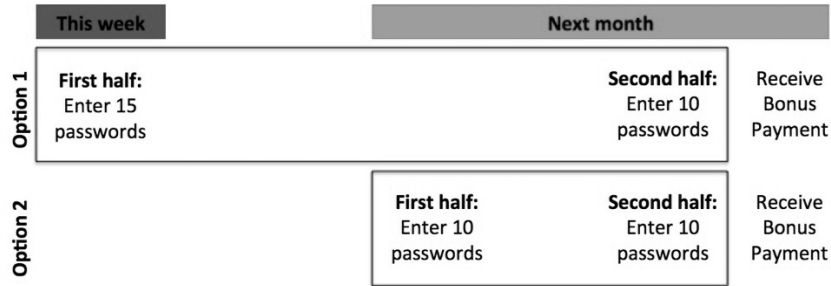


*Note.* Error bars represent 95% confidence intervals.

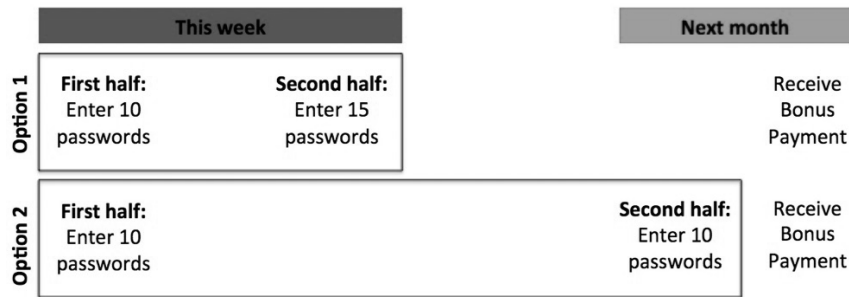
**Figure 2.1: Design of Study 4, Chapter 2**

Timelines of the options in the start and finish conditions of Study 4.

**Start condition:**



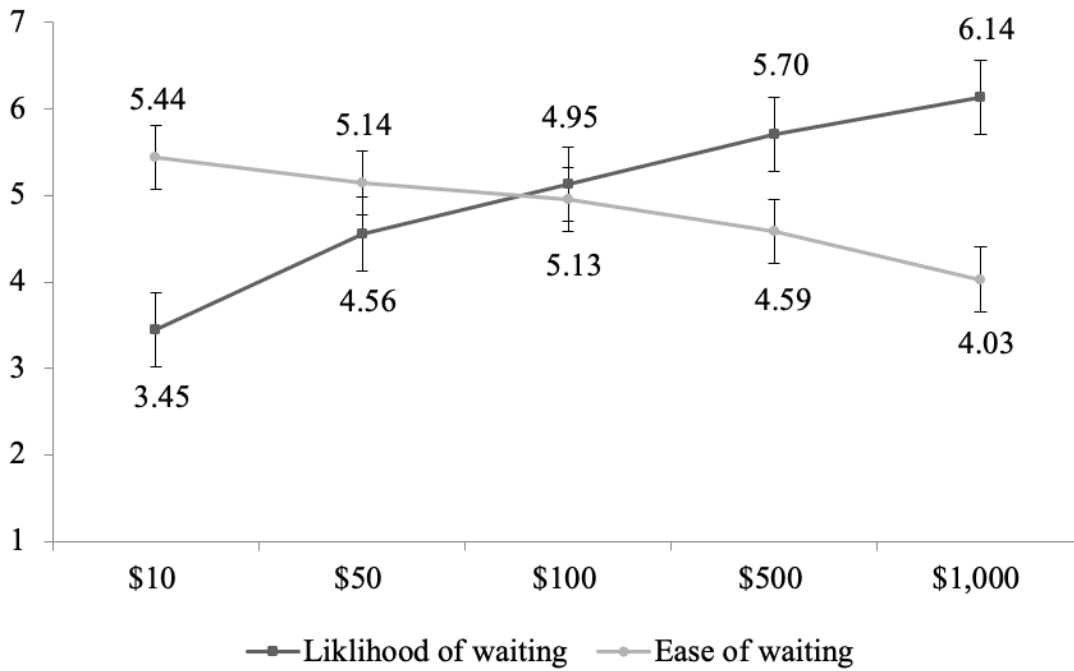
**Finish condition:**



**Figure 3.1: Results from Study 1, Chapter 3**

Participants' likelihood of waiting (patient choice) and ease of waiting (patient experience) for the amount indicated in three months instead of receiving half of that amount sooner.

Participants made more patient choices for larger magnitudes of money, even though they anticipated feeling less patient waiting for larger magnitudes of money.

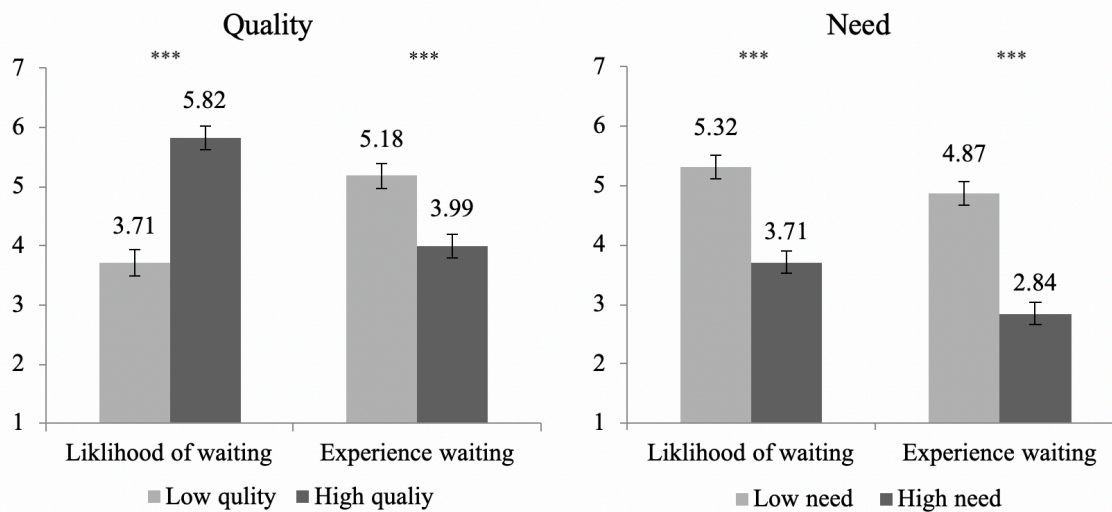


*Note.* Error bars represent 95% confidence intervals.



**Figure 3.2: Results from Study 5, Chapter 3**

Participants were more likely to wait for higher (vs. lower) quality products, even though they anticipated it would be harder to wait for higher (vs. lower) quality products. This effect was moderated for needs. Participants were less likely to wait for products that they needed more (vs. less) and found it harder to wait for products that they needed more (vs. less).



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