When wanting closure reduces patients’ patience
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ABSTRACT
What makes patients impatient? We find that people both make impatient health decisions and experience impatience when waiting for healthcare partially because they are eager to achieve psychological closure on their goals. Across five preregistered studies (N = 1806), we first document an increased preference for a worse health device (Study 1) and more painful treatment (Study 2) when they allow for earlier goal closure, even though they would not provide remedy sooner. We next find that because the desire to achieve closure increases with proximity to a goal, the experience of impatience increases closer to the completion of a medical checkup (Studies 3–5). We discuss the implications of people’s desire to reach goal closure on the pursuit of both health habits and health care.

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What makes the experience of waiting for healthcare so unpleasant? In these situations, there is potentially another factor that contributes to the negative experience of waiting: people’s desire to achieve closure on their goals. That is, we hypothesize that people are impatient partially because they want to complete their goal. In what follows, we explore how the desire for goal closure influences impatience in health decisions and experiences. We first explore whether people are willing to endure worse healthcare if it enables earlier goal closure, even though it does not provide a faster remedy. We next test whether people’s proximity to achieving a goal—a factor that increases the desire for closure—increases their experience of impatience when waiting. Thus, we explore how the desire for goal closure influences two aspects of impatience: choosing a sooner over a later option (an impatient decision) and having a negative experience while waiting (an experience of impatience).

1. Patient health decisions
Traditionally, researchers operationalized patience as the ability to delay gratification in intertemporal choice (Ainslie, 1975; Hoch & Loewenstein, 1991; Loewenstein & Prelec, 1992; Malkoc & Zauberman, 2006; Read, 2001; Soman, 1998; Zauberman, Kim, Malkoc, & Bettman, 2009). Intertemporal choices involve a tradeoff between time and value.

pa-tient
Origin: Middle English: from Old French, from Latin patient-‘suffering’, from the verb pati

The English word “patient” refers to both a person receiving medical care and a person who is able to wait. The dual meanings are not accidental. The two words have the same origin as “the one who suffers.” Just as a sick medical patient suffers from their ailment, the need to wait also induces suffering. Ironically, however, the pursuit of routine health care often also imposes a long wait.

Indeed, waiting is ubiquitous in health care. To maintain their health goals, patients regularly need to wait for an available appointment, wait until the doctor is ready to see them at the appointment, wait to receive vaccinations, and wait to pick up prescriptions at the pharmacy. Despite the frequency of its occurrence, waiting is an emotionally difficult and unpleasant experience. Longer waiting periods at medical centers result in worse evaluations of medical care and lead people to switch medical providers (Taylor & Benger, 2004). According to surveys, one in five patients have switched doctors because of long wait times and 30% of patients have left a doctor appointment before receiving any care due to a long wait (Vitals’ 9th Physician Wait Time Report, 2018). People’s experience of impatience appears to impact their decision-making and ultimately, their health.

What makes the experience of waiting for healthcare so unpleasant? To begin with, people might seek remedy for an ongoing physical discomfort, in which case prolonging the wait implies prolonging the physical suffering. Further, people might experience fear or worry, such as when waiting for test results that will confirm or preclude the possibility of a disease (Sweeney, 2018). However, for routine health care, these factors are less likely to cause impatience.

In these situations, there is potentially another factor that contributes to the negative experience of waiting: people’s desire to achieve closure on their goals. That is, we hypothesize that people are impatient partially because they want to complete their goal. In what follows, we explore how the desire for goal closure influences impatience in health decisions and experiences. We first explore whether people are willing to endure worse healthcare if it enables earlier goal closure, even though it does not provide a faster remedy. We next test whether people’s proximity to achieving a goal—a factor that increases the desire for closure—increases their experience of impatience when waiting. Thus, we explore how the desire for goal closure influences two aspects of impatience: choosing a sooner over a later option (an impatient decision) and having a negative experience while waiting (an experience of impatience).

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They require that people decide between a smaller-sooner and a larger-later reward. Within this paradigm, a patient person is the one who opts for the larger-later reward (Ainslie & Haslam, 1992; Frederick, Loewenstein, & O’Donoghue, 2002).

Patience, in turn, enables important life outcomes. Those who delay gratification in the classic marshmallow test paradigm were found to achieve more academic success and cope better with stress and frustration throughout their life (Shoda, Mischel, & Peake, 1990; see also a recent replication which documented a smaller effect; Watts, Duncan, & Quan, 2018). Importantly, patience is associated with healthier choices throughout one’s lifetime (Urminsky & Baumbauer, 2017). For example, preschoolers’ performance in the delay of gratification task predicted their body mass index 30 years later (Schlam, Wilson, Shoda, Mischel, & Ayduk, 2013). Additionally, impatience in a delay-discounting task was associated with earlier age of first sexual activity, smoking, and higher body mass index (Reimers, Maylor, Stewart, Ayduk, 2013). Additionally, impatience in a delay-discounting task was associated with earlier age of first sexual activity, smoking, and higher body mass index (Reimers, Maylor, Stewart, & Chater, 2009).

The ability to delay gratification is often equated with resisting the appeal of temptations through self-control (Duckworth, Tsukayama, & Kirby, 2013; Mischel, Shoda, & Rodriguez, 1989). Self-control strategies accordingly increase patience. People are more patient, for example, when they think about the rewards in abstract rather than arousing terms (Metcalfe & Mischel, 1999; Nordgren & Chou, 2011), focus on the goal-relevant features of the choice (Fujita & Carnevale, 2012; Fujita, Trope, Liberman, & Levin-Sagi, 2006), or feel more connected to their future self (Bartels & Urminsky, 2011; Ersner-Hershfield, Wimmer, & Knutson, 2009).

Other theoretical perspectives portrayed patience as a preference rather than a self-control ability. That is, people are impatient because they prefer the smaller-sooner reward to the larger-later reward. Indeed, people are often impatient because they are uncertain if waiting will pay off, either because they do not trust that the larger-later reward will materialize (i.e., that whoever promised it will deliver; Michaelson & Munakata, 2016) or estimate the remaining wait before receiving the reward as too long (McGuire & Kable, 2013). For example, people may decide to prematurely start an antibiotic treatment with negative side effects because they are uncertain if their ailment will go away on its own. If a person suspects the larger-later reward will not materialize or will take too long to materialize, then opting for a smaller-sooner reward simply reflects what the (impatient) person believes is the right choice in a given situation (Kidd, Palmeri, & Aslin, 2013). This person is impatient because they prefer the smaller-sooner option, not because they cannot resist the temptation.

Alternatively, the subjective value of the outcomes can influence patience. Some outcomes are worth waiting for more than others. For example, people are more patient when waiting for larger magnitudes of money (Thaler, 1981) or consumer products they like more (Roberts et al., in press). People are also more patient when they are required to wait before making the intertemporal choice, as waiting leads people to appreciate whatever they are waiting for more (Dai & Fishbach, 2012; Imas, Kuhn, & Mironova, 2016). Thus, people might be more willing wait for medical care that is very important for them or after they have already waited for a while.

However, these previous accounts might not explain impatience in certain healthcare situations. Consider a person deciding between an inferior medical treatment sooner and a superior medical treatment later, such as waiting for a non-invasive procedure instead of getting a painful and invasive procedure sooner or waiting for an appointment with the recommended medical specialist instead of scheduling a visit with a general practitioner sooner. With routine healthcare or mild ailments, it is unclear that the immediate option (e.g., getting an invasive medical procedure or having an appointment with a general practitioner) carries a visceral appeal. In many medical situations, people are not attracted to the smaller-sooner option because they cannot resist the temptation. Medical procedures and doctor’s appointments are not visceral temptations. It is also less clear that what makes people impatient in these situations is that they are uncertain about the delivery of the larger-later option or that the option is not sufficiently valuable to be worth the wait. A patient might recognize the value in waiting for superior health care but choose not to do so. To account for people’s impatience in many health decisions, we propose a new factor that influences patience: the desire to achieve closure on a goal.

2. Wanting goal closure decreases patience

The desire to wait for the larger-later option often conflicts with the motivation to achieve closure by completing a goal. For example, the choice to wait for a non-invasive medical procedure instead of getting a more invasive medical procedure sooner postpones completing the treatment. When people opt for a sooner treatment, we suggest they are driven by a desire to achieve psychological closure. In lay terms, they want to take the medical procedure “off their plate.” This desire for closure occurs both because completing a goal is a gain and because leaving a goal unresolved is a cost.

Specifically, finishing the goal is a gain because it is a source of satisfaction. When one’s goal is to send an email, hitting “send” feels good, which is one reason why some emails are sent too soon. This eagerness to achieve a goal increases when people get closer to goal attainment (Hull, 1932; Koo & Fishbach, 2012; Nunes & Dreze, 2006; Wadhwa & Kim, 2015). For example, consumers enrolled in a loyalty program purchased coffee more frequently when they were closer to earning a free coffee (Kivetz, Urminsky, & Zheng, 2006), borrowers accelerated debt repayments when they were closer to paying off a loan (Brown & Lahey, 2015), and donors increased giving when they were closer to achieving a funding goal (Dai & Zhang, 2019). Additionally, people took shorter breaks between trials the closer they were to finishing an experimental task (Toure-Tillery & Fishbach, 2012). When people are close to finishing a goal, they become more eager to achieve closure.

Further, leaving a goal unresolved comes with a psychological cost. Not finishing a task can be mentally costly because people either cannot get it off their mind or they are concerned they will forget about it. For example, people who were interrupted during an experimental task could not fully disengage from it and remembered the incomplete parts of the task better than the completed parts (Zeigarnik, 1927). And while people sometimes struggle to get unresolved goals off their mind (Masicampo & Baumeister, 2011), other times they are concerned they will forget to finish the goal. In these situations, people may actively invest mental effort in trying to remember to complete the goal. Either way, the unresolved goal is psychologically costly.

Research on the need for cognitive closure similarly documented peoples’ desire to reach fast or extreme conclusions in order to take a topic of their mind (Webster & Kruglanski, 1994). Although the need for cognitive closure was studied in the domain of attitude formation (e.g., Jost, Glaser, Kruglanski, & Sulloway, 2003; Kruglanski & Webster, 1996), it reaches a similar conclusion: Finishing tasks feels good and unfinished tasks are psychologically costly.

Notably, while postponing tasks poses psychological costs (from the lack of goal closure), it also offers potential benefits. The value of both costs and benefits is smaller in the future than in the present (Ainslie & Haslam, 1992; Frederick et al., 2002). This leads people to procrastinate, as the effort involved in completing a task in the future seems smaller than the effort involved in completing it now (Akerlof, 1991; Soman, 1998). The desire to postpone tasks stands in contrast to the desire to complete them sooner in order to achieve closure.

The motivation to complete a goal can in turn result in impatient choices. As initial evidence, Jhang and Lynch (2014) found that when people were close to finishing a task, they were willing to earn less money in order to finish the task before starting a new one. That is, people sacrificed payoff to achieve closure sooner. Additionally, individual differences in the need for cognitive closure predicted impatience (Schumpe et al., 2017). People with intolerance for uncertainty and ambiguity were more impatient in a delay discounting task, preferring
smaller but more certain monetary options. These results suggest situations that create a desire for closure may lead people to be more impatient. In the domain of healthcare, it is possible that people may prefer otherwise worse health care that occurs sooner in order to achieve closure, thereby reducing the psychological cost of leaving the health goal unresolved.

3. Impatience as an experience

Whereas impatience was traditionally studied within the inter-temporal choice paradigm, many everyday situations that involve impatience do not impose a choice between options that differ in their timing and value. When people are waiting at the DMV or on a long flight, there is no immediate decision they can make, yet their experience of impatience matters both for their wellbeing during the experience and for how they evaluate the experience (e.g., the service) in retrospect.

Similarly, when pursuing health goals, the experience of impatience is both common and consequential. For example, when waiting for medical test results or for a diet to deliver the expected results, people are not faced with choices between time and value, but are simply required to wait until the results arrive. We define the experience of patience as one’s ability to wait without suffering. It stands in contrast to feeling discomfort, agitated, frustrated, and ultimately, impatient, while waiting.

The experience of impatience is distinct from anticipation and dread. Impatience requires waiting whereas anticipation and dread do not. For example, anticipation before taking a bite of chocolate or bread before starting an unpleasant project at work involve an active pursuit rather than a wait (Loewenstein, 1987; Loewenstein, Weber, Hsee, & Welch, 2001). Additionally, some situations evoke dread more than impatience and vice versa. While waiting for a painful medical procedure to start may primarily evoke dread, waiting for a doctor to sign a routine health form after an appointment would evoke more impatience than dread. In this case, impatience may be more akin to boredom (Eastwood, Frischen, Fenske, & Smilek, 2012). Additionally, while people may feel uncertain or anxious during a wait, impatience does not require these emotions. People are impatient when waiting for an outcome that is certain, such as when waiting in the lobby for an appointment to start, as well as positive outcomes, such as waiting for a doctor to remove a cast after an injury has healed.

4. Present research

We propose that the motivation to reach goal closure increases impatience in the health domain. We first tested this proposition in the context of intertemporal choice. We predicted:

**H1.** People are willing to endure worse health care more when it enables them to achieve goal closure sooner.

People may naturally display impatience when they need immediate remedy. However, we predict that people are more likely to choose worse health care when it is available sooner, even when it does not provide remedy sooner. That is, people will endure worse healthcare more when it enables sooner goal closure but not sooner remedy. For example, people might choose an inferior health device because they can order it sooner, even if it will not arrive sooner. Additionally, people may opt for a more painful treatment that is available sooner, even if the benefits will not materialize sooner. Thus, people may be willing to compromise the quality of health care or ease of a procedure if it allows for earlier closure.

Moving beyond intertemporal choice, we further predict that the desire for goal closure leads to impatient experiences. Specifically, we explore how the proximity to goal completion influences the experience of impatience. Given that eagerness to complete a goal increases as distance to goal attainment shrinks (Hull, 1932; Kivetz et al., 2006; Koo & Fishbach, 2012; Nunes & Dreze, 2006; Wadhwa & Kim, 2015), we predict impatience increases with proximity to goal completion. Stated formally:

**H2.** People experience more impatience when they are closer to completing a health goal (e.g., a medical appointment).

For example, we predict people will have a harder time tolerating wait periods when they expect the appointment to start soon (vs. in a while) or when they are waiting at the end of an appointment (vs. at the beginning). Relatedly, we predict people will experience more impatience when waiting in the exam room than in the reception area, as the exam room is closer to completing the medical appointment.

In what follows, we describe five preregistered studies that tested these hypotheses. To maximize power, across studies we calibrated our measures and manipulations with pilot studies, which are available on OSF. These pilot studies yielded small to large effect sizes (between $d = 0.34$ and $d = 0.99$). Accordingly, we targeted a sample of at least $100$ participants per cell to achieve a power of $0.80$ with a medium effect size. All sample sizes were determined prior to data collection. Full materials and data for all reported experiments are archived on OSF (http://tinyurl.com/osf-patients-patience). We reported participant attrition in Appendix A (Zhou & Fishbach, 2016). We summarize our findings in Table 1.

5. Study 1: Choose worse healthcare

Using an incentive-compatible task, Study 1 tested whether people would prefer a worse healthcare product more when it enables earlier goal closure (H1). In order to control for the possibility that people choose a worse health product because they need to use it sooner, participants chose between two products, one superior to the other, that would arrive at the same time. The only difference was in the time participants would complete the work to receive them.

Specifically, participants chose between completing a task to enter a lottery for a standard pulse oximeter (inferior option) and a premium pulse oximeter (superior option). When both tasks were available simultaneously, we predicted participants would choose the task that makes them eligible for the superior device. However, when the task for the inferior device was scheduled earlier than the task for the superior device, we predicted more participants would choose the task that makes them eligible for the inferior device. That is, a larger proportion of participants would choose the inferior medical device when they could complete the task associated with it sooner, because finishing the

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**Table 1: Overview of Studies.**

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Main Finding</th>
<th>Statistical Test</th>
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<tbody>
<tr>
<td>1</td>
<td>401</td>
<td>Participants were more likely to choose an inferior pulse oximeter when they could qualify for it before a superior model than when they could qualify for both models at the same time (H1).</td>
<td>$\chi^2 (1, N = 364) = 8.56$, $p = .003$</td>
</tr>
<tr>
<td>2</td>
<td>201</td>
<td>Participants were more likely to choose a painful shot when it was delivered before a painless pill than when both treatments were available simultaneously (H1).</td>
<td>$\chi^2 (1, N = 201) = 27.99$, $p &lt; .001$</td>
</tr>
<tr>
<td>3</td>
<td>401</td>
<td>Waiting in the exam room for 9 min led to more impatience for participants who were expecting to wait 10 (vs. 20) min (H2).</td>
<td>$F(1, 333) = 19.75$, $p &lt; .001$</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
<td>Participants were more impatient when waiting for a doctor’s signature after a medical checkup than before (H2).</td>
<td>$t(395) = 2.14$, $p = .033$</td>
</tr>
<tr>
<td>5</td>
<td>403</td>
<td>Participants experienced more impatience when waiting for a medical appointment to start in the exam room than in the reception area (H2).</td>
<td>$t(378) = 2.49$, $p = .013$</td>
</tr>
</tbody>
</table>
5.1. Method

5.1.1. Participants

We opened the survey to 400 participants from the US on Prolific Academic in exchange for $0.55; Prolific returned 401 respondents. Per our preregistration, we analyzed responses only from participants who did not already own a pulse oximeter device and provided a valid answer to an open response question at the beginning of the survey, resulting in a final sample of 364 participants (205 women; 58.21, \( \mu_{\text{age}} = 33.34, \sigma_{\text{age}} = 11.53 \)).

5.1.2. Procedure

This study used a 2-condition (Timing: inferior product-sooner vs. simultaneous) between-participants design. In the study, participants read about a pulse oximeter, which is a medical device that clips onto the finger to read blood oxygen levels and heart rate. The device became popular during the COVID-19 pandemic because having low oxygen levels can be a sign of the disease. Participants learned about the benefits of owning a pulse oximeter and were invited to choose between completing a bonus task for a chance to win a standard pulse oximeter (inferior option) or a premium pulse oximeter (superior option). Participants read that the premium pulse oximeter offered more accurate measurements, a longer battery life, a better display, and a longer warranty than the standard pulse oximeter.

The main measure in this study was participants’ choice to either enter the lottery for the standard pulse oximeter or premium pulse oximeter. In order to enter either lottery, participants read they would need to complete a bonus task about their health habits at a later time. Specifically, the bonus task for the premium pulse oximeter would occur in two weeks. We manipulated the timing of the bonus task for the standard pulse oximeter. In the inferior-product-sooner condition, participants read they could complete the bonus task for the standard pulse oximeter the next day, while in the simultaneous-products condition, participants read they could complete the bonus task for the standard pulse oximeter in two weeks. That is, in the inferior-product-sooner condition, the bonus task for the standard device occurred two weeks earlier than the bonus task for the premium device, while in the simultaneous-products condition, the bonus tasks for the standard and premium devices occurred at the same time. Importantly, participants needed to remember to complete the bonus task at a later date in both conditions, and learned they would receive the pulse oximeter in three weeks regardless of which lottery they chose to enter. Completing the bonus task sooner would not result in getting the product sooner.

After reading the lottery instructions, participants who passed an attention check (answering when is each task would be scheduled and when the device would be delivered) were eligible to indicate their choice between the two lotteries. They then rated how much they wanted a pulse oximeter and how likely they were to complete the bonus task (2 items: 1 = not at all, 7 = very much).

5.2. Results and discussion

In support of H1, participants were more likely to choose to enter the lottery for the standard pulse oximeter in the inferior-product-sooner condition (25%) than in the simultaneous-products condition (13%), \( \chi^2(1, N = 364) = 8.56, p = .003 \). That is, participants were more likely to choose to receive a worse healthcare device when they could complete the bonus task for the device the next day compared to when they could complete the bonus task for the device in two weeks, even though both devices would arrive at the same time.

Additionally, there was no significant difference in participants’ desire for a pulse oximeter between the inferior-product-sooner (\( M = 4.14, SD = 1.76 \)) and simultaneous-products conditions (\( M = 3.91, SD = 1.82 \)), \( t(362) = 1.26, p = .209 \), and no significant difference in participants’ interest in completing the bonus task between the inferior-product-sooner (\( M = 5.48, SD = 1.69 \)) and simultaneous-products conditions (\( M = 5.15, SD = 1.91 \)), \( t(362) = 1.74, p = .083 \).

In this incentive-compatible study, participants were more likely to opt for an inferior pulse oximeter when they could do the work to qualify for it sooner, even though completing the work sooner did not allow them to receive the device sooner. Interestingly, while models of intertemporal choice predict that people prefer to delay costs, including completing work (Frederick et al., 2002; Soman, 1998; Zauberman & Lynch, 2005), these results suggest that when people are eager to complete a goal and achieve closure, they might instead choose to accelerate work.

6. Study 2: Choose more pain

Study 2 tested whether people prefer a painful treatment more when it allows them to achieve closure sooner (H1). We presented participants with a scenario about two equally effective vaccination treatments that vary in their level of pain. We predicted that people would be more likely to choose the painful treatment when it was delivered before the painless treatment than when the two treatments were available simultaneously. We preregistered Study 2 at https://aspredicted.org/7mp37.pdf.

6.1. Method

6.1.1. Participants

We recruited 201 participants from several locations at a Midwestern university, business school, and downtown lab in exchange for either $1 or a small gift (79 women; \( \mu_{\text{age}} = 30.21, \sigma_{\text{age}} = 15.50 \)).

6.1.2. Procedure

This study used a 2-condition (Timing: painful treatment sooner vs. simultaneous treatments) between-participants design. Participants read a scenario stating that they were leaving for an international trip in one month. Before they leave, the doctor recommended boosting their immunity to several infectious diseases that they can only catch while abroad. There were two equally effective options for boosting their immunity: a painful shot or a painless medication.

Participants read that the medication would be available in two weeks. We manipulated the timing of the shot. In the painful-treatment-sooner condition, participants read they could come back to the doctor to get a shot the next day, while in the simultaneous-treatments condition participants read they could come back to the doctor to get a shot in two weeks. That is, in the painful-treatment-sooner condition, the shot option occurred two weeks earlier than the medication option, while in the simultaneous-treatments condition the shot and the medication options were both available at the same time. Importantly, choosing the shot still required a second visit to the clinic, albeit this visit would occur sooner. Further, the health benefits of receiving the treatment would not occur until the start of the vacation (i.e., in one month) regardless of their choice. Completing the treatment sooner would not result in any medical benefits.

After reading the scenario, participants who passed an attention check (answering which treatment would be available sooner and which treatment would be more painful) were eligible to indicate their choice between a shot and a medicine.

6.2. Results and discussion

In support of H1, participants were more likely to choose the painful shot in the painful-treatment-sooner condition (68%) than in the simultaneous-treatments condition (31%), \( \chi^2(1, N = 201) = 27.99, p < .001 \). That is, participants were more likely to choose to receive a painful shot when they could get it the next day compared to when they could...
only get it in two weeks, even though there was no medical advantage to receiving the treatment sooner.

We note that given 31% of participants preferred the shot when it was available at the same time as the painless treatment, there are potentially other reasons to prefer a shot to a medication. However, the difference between the two conditions is likely driven by the fact that the shot was available sooner. Participants chose to endure a painful procedure because it allowed them to achieve closure sooner.

Interestingly, while people typically prefer to both reduce and delay experiences of pain, in Study 2 we found that people preferred to experience more pain sooner in order to achieve goal closure. This suggests that people value advancing goal closure more than the additional pain from receiving a shot.

Taken together, Studies 1 and 2 find that the ability to achieve closure on a health goal increases impatience. Specifically, participants opted for inferior medical devices (Study 1) and procedures (Study 2) when it enabled them to achieve closure sooner. These studies held the timing of the benefits constant (i.e., the delivery of the pulse oximeter or the boosted immunity), regardless of participants’ choice. Additionally, for all choice options, participants needed to reengage with the task at a later date (i.e., return to Prolific for the bonus task or the doctor’s office for the treatment). Yet, participants were willing to accelerate losses by completing work and enduring pain sooner if it allowed them to achieve psychological closure sooner.

7. Study 3: More impatient at the end of a wait

Moving from impatient decision-making to the experience of impatience, in Study 3 we tested whether the desire for goal closure increases feelings of impatience while waiting. One factor that determines the desire for closure is the distance to goal attainment, as eagerness to complete a goal increases as distance to goal attainment shrinks (Hull, 1932; Kivetz et al., 2006; Koo & Fishbach, 2012; Nunes & Dreze, 2006; Wadhwa & Kim, 2015). Thus, people should display greater impatience when they are closer to completing a goal (H2). In Study 3, we accordingly tested whether people experience more impatience when they are closer to finishing a medical appointment. We predicted that even when participants waited the same amount of time, they would experience more impatience when the wait was nearly over than when it was only halfway through. That is, after waiting for 9 min, those expecting the total wait to be 10 min would be more impatient than those expecting the wait to be 20 min. We preregistered Study 3 at https://aspredicted.org/a7az7.pdf.

7.1. Method

7.1.1. Participants

We opened the survey to 400 participants from the US on Amazon Mechanical Turk (MTurk) in exchange for $0.30; MTurk returned 401 respondents. Per our preregistration, we analyzed responses only from participants who passed an attention check question at the end of the survey, resulting in a final sample of 335 participants (153 women; M_age = 36.85, SD_age = 10.21).

7.1.2. Procedure

We assigned participants to a 2 (Expected Wait: 10 min vs. 20 min) × 2 (Time of Measurement: 3 min vs. 9 min) mixed design, where Expected Wait was a between-participants factor and Time of Measurement was a within-participants factor. Participants read a scenario where they had an appointment at the doctor’s office, and when they arrived the nurse took them to the exam room to wait until the doctor was ready for the appointment. Participants viewed a picture of an exam room and described in a few sentences how they would feel while waiting. Next, participants read that the doctor was finishing with another patient and would be ready to see them after. They rated how impatient they would be, first after waiting for 3 min and then after waiting for 9 min.

Specifically, participants rated how much (a) emotional discomfort and (b) impatience they would feel (2 items: 1 = none; 7 = very much). We averaged these measures into an impatience index (Time 1: r = 0.836, Time 2: r = 0.802). At the end of the survey, participants completed an attention check (answering how close they would be to the start of the doctor’s appointment after waiting 9 min).

7.2. Results and discussion

A mixed ANOVA of the impatience index yielded a significant main effect of the Time of Measurement, F(1, 333) = 194.05, p < .001, η²_p = .37. Participants reported they would experience more impatience after waiting for 9 min than after waiting for 3 min. There was no significant main effect of the Expected Wait (p = .295).

In support of H2, we also found a significant Expected Wait × Time of Measurement interaction, F(1, 333) = 17.95, p < .001, η²_p = .06. After 3 min, participants reported a similar level of impatience, regardless of whether they expected to wait for 10 min or 20 min, t(333) = 0.19, p = .850. However, after 9 min, participants reported more impatience if they expected the wait to take 10 min compared to 20 min, t(333) = 2.26, p = .025. We summarized these findings in Fig. 1.

Overall, while impatience increased over time, this effect was accentuated when participants perceived that they were close to finishing the wait (i.e., 9 min in to a 10 min wait) compared to when they were halfway through the wait (i.e., 9 min in to a 20 min wait). The same experience of waiting was worse for participants when they were close to completing the goal.

8. Study 4: More impatient at the end of an appointment

In Study 4, we tested H2 by comparing people’s experience of impatience when waiting for the doctor to sign a form at the beginning of an appointment (before receiving a medical checkup) versus the end of an appointment (after receiving a medical checkup). We predicted that participants would be more impatient when waiting after the checkup, when they were closer to completing the appointment. In addition to impatience, we also measured participants’ desire for goal closure. We predicted that waiting for the doctor after the checkup would elicit a greater desire for goal closure than waiting before the checkup.

This study also allowed us to separate impatience from the experience of dread. In Study 3, participants could have experienced greater dread along with greater impatience when they were closer to the appointment. However, in this study, we predicted participants would experience more impatience but less dread after the checkup compared to before the checkup.

Finally, we also measured how typical it is to wait for the doctor before versus after the checkup, to address the potential alternative that unusual waiting periods create impatience rather than the desire for goal closure. We predicted participants would believe it is more typical to wait for a doctor to sign a form after receiving the checkup compared to before, which is also when they would be more impatient. Thus, in this study we test whether people feel more impatient after a checkup because it is closer to the end of the appointment rather than because they feel more dread or believe the wait is unusual. We preregistered Study 4 at https://aspredicted.org/q2e22.pdf.

8.1. Method

8.1.1. Participants

We opened the survey to 400 participants from the US on Prolific Academic in exchange for $0.55; Prolific returned 400 respondents. Per our preregistration, we analyzed responses only from participants who provided a valid answer to an open response question at the beginning of the study, resulting in a final sample of 398 participants (225 women;
M_{age} = 32.70, SD_{age} = 11.12).

8.1.2. Procedure

This study used a 2-condition (Wait: before vs. after) between-participants design. Participants read a scenario where they are at the doctor’s office for an annual physical exam. While a nurse practitioner will administer the physical exam, a doctor must review and sign the exam form. All participants read that they have been waiting for the doctor to sign the form for 30 min already. In the wait-before condition, participants read that the nurse practitioner is ready to start the checkup, but the doctor needs to sign the form before the checkup can start. In the wait-after condition, participants instead read that the nurse finished the checkup, but the doctor needs to sign the form before the participant can go home. Therefore, in the wait-before condition participants are waiting for the doctor before getting the checkup while in the wait-after condition participants are waiting for the doctor after getting the checkup.

After reading the scenario, participants who passed an attention check (answering why they were waiting for the doctor and what happens after the doctor signs the form) were eligible to rate their reactions. To assess impatience, participants rated how (a) impatient, (b) agitated, and (c) frustrated they would feel while waiting (3 items: 1 = not at all; 7 = very). These measures were slightly different from the impatience measures in Study 3 in order to assess more aspects of the experience of impatience. We averaged these measures into an impatience index (a = 0.869). To assess the desire for goal closure, participants rated how much they felt (a) eager to finish the appointment, (b) eager to cross the appointment off their list of things to do today, and (c) eager to move on to the other things (3 items: 1 = not at all, 7 = very). We averaged these measures into desire for goal closure index (a = 0.754).

To assess dread, participants rated how much dread they would feel while waiting (1 = not at all; 7 = very). Additionally, to assess the perceived typicality of the waiting period, participants rated how typical it is to need to wait for a doctor to sign a form (a) before getting the checkup and (b) after getting the checkup (2 items: 1 = not at all, 7 = very). Finally, as a manipulation check, participants rated how close they were to finishing the appointment and going home while they waited (1 = not at all, 7 = very).

8.2. Results and discussion

The manipulation check confirmed that participants believed they were closer to finishing the appointment and going home when waiting after the checkup (M = 6.00, SD = 1.32) compared to when waiting before the checkup (M = 2.91, SD = 1.54), t(396) = 21.49, p < .001.

In support of H2, participants reported more impatience when waiting after the checkup (M = 5.43, SD = 1.21) compared to when waiting before the checkup (M = 5.15, SD = 1.37), t(395) = 2.14, p = .033. That is, the experience of impatience was greater at the end of the appointment than the beginning of the appointment.

Participants also felt a marginally stronger desire for goal closure when waiting after the checkup (M = 6.05, SD = 0.90) compared to when waiting before the checkup (M = 5.88, SD = 0.99), t(395) = 1.85, p = .065. That is, participants felt significantly more eager to finish the appointment, t(395) = 3.30, p = .001, and eager to move on to the other things, t(395) = 2.77, p = .006, when waiting after the checkup compared to when waiting before the checkup, but there was no difference in how eager participants were to cross the appointment off their list of things to do that day, t(395) = 0.78, p = .437. Overall, the desire for goal closure was somewhat stronger at the end of the appointment than the beginning of the appointment.

Additionally, participants reported less dread when waiting after the checkup (M = 2.43, SD = 1.47) compared to when waiting before the checkup (M = 2.83, SD = 1.70), t(395) = 2.51, p = .013. Participants also reported that it was more typical to need to wait for a doctor to sign a form after the checkup (M = 4.54, SD = 1.78) compared to before the checkup (M = 2.67, SD = 1.75), t(397) = 13.96, p < .001. Participants experienced less dread and thought it was more typical to wait at the end of the appointment than the beginning of the appointment.

In Study 4, participants’ felt more impatient when waiting for a doctor to sign a form after a medical checkup compared to before a medical checkup. Thus, participants experienced more impatience when they were closer to finishing a medical goal. This was unlikely driven by feelings of dread or perceptions of the wait as unusual, as participants experienced less dread and thought waiting was more typical after the checkup.

9. Study 5: More impatient in the exam room

When checking into a medical appointment, patients typically expect to first wait in the reception area with other patients and then wait again in the individual exam room. Clinics can choose what proportion of the time patients wait in the reception area versus the exam room. What are the implications for patients’ patience? Our analysis suggests that

![Fig. 1. Impatience as a function of the time of measurement (3 vs. 9 min) and the expected wait time (10 vs. 20 min). After 9 min of waiting, participants who expected the wait to take 10 min reported greater impatience than those expecting it to take 20 min. Error bars represent 95% confidence intervals.](image-url)
because the exam room is closer to finishing the goal of receiving medical care, it elicits a stronger desire for goal closure than the reception area. Therefore, we predicted that participants would both experience more impatience and a greater desire for goal closure when waiting in exam room compared to the reception area (H2). We tested this prediction in Study 5, which we preregistered at https://aspredicted.org/q2fu9.pdf.

9.1. Method

9.1.1. Participants

We opened the survey to 400 participants from the US on Prolific Academic in exchange for $0.40; Prolific returned 403 respondents. Per our preregistration, we analyzed responses only from participants who provided a valid answer to an open response question at the beginning of the survey and passed an attention check question at the end of the survey, resulting in a final sample of 380 participants (204 women; M\text{age} = 30.15, SD\text{age} = 10.44).

9.1.2. Procedure

This study used a 2-condition (Waiting Area: exam room vs. reception area) between-participants design. Participants read a scenario where they were at the doctor’s office for a routine annual check-up. In the exam room condition, participants were told that when they arrive at the doctor’s office, a nurse has them sit in the exam room to wait until the doctor is ready to see them. In the reception area condition, participants were instead told that when they arrive at the doctor’s office, the receptionist has them sit in the reception area until the doctor is ready to see them. In both conditions, participants viewed a picture of the room where they were waiting and described in a few sentences how they would feel while waiting before answering the primary dependent variables.

To measure impatience, as in Study 3, participants rated how much (a) emotional discomfort and (b) impatience they would feel (2 items: 1 = none; 7 = very much). We averaged these measures into an impatience index (r = 0.555). As an additional measure of impatience, participants rated how many minutes they would need to wait in the room until they became frustrated with waiting (0 through 60 min).

Participants also reported their anticipated physical discomfort (1 = none; 7 = very much). This item was intended to test if the experience of waiting was affected by the environmental differences between the two rooms rather than the desire for goal closure. We did not predict a difference in physical discomfort between the two conditions.

As in Study 4, we also measured the desire for goal closure in each of the rooms. Specifically, participants rated (a) how much they wish they could start the appointment and (b) how eager they were to start the appointment (2 items: 1 = not at all, 7 = very much). These measures were different from the desire for goal closure measures in Study 4 in order to assess more aspects of the desire for goal closure. We averaged these measures into a desire for goal closure index (r = 0.543). Next, as a manipulation check, participants rated how close to the start of the appointment they were when waiting in the exam room or the reception area (1 = not at all, 7 = very much). At the end of the survey, participants completed an attention check (answering where they were waiting for the doctor’s appointment).

9.2. Results and discussion

We ran a pre-test on MTurk to assess whether patients tend to wait longer in the exam room than the reception area (N = 361; 159 women; M\text{age} = 38.21, SD\text{age} = 12.02). In the pre-test, participants recalled how long they waited in both the exam room and the reception area during their last visit to the doctor’s office. Participants reported waiting in the reception area (M = 18.17 min, SD = 12.07) approximately three and a half minutes longer than in the exam room (M = 14.70 min, SD = 11.98), \(t(360) = 6.63, p < .001\).

In support of H2, participants felt more impatient when waiting in the exam room (M = 3.99, SD = 1.39) compared to the reception area (M = 3.63, SD = 1.43), \(t(378) = 2.49, p = .013\). Additionally, participants became frustrated faster when waiting in the exam room (M = 13.70 min, SD = 8.57) compared to the reception area (M = 24.11 min, SD = 11.86), \(t(378) = 9.72, p < .001\). Importantly, while the pre-test found that people recalled waiting on average three and a half minutes longer in the reception area than the exam room, participants in this study became frustrated waiting in the exam room approximately ten minutes faster than in the reception area. Thus, it is unlikely that the difference in frustration is due to differences in the expected wait time alone.

As expected, there was no significant difference in the amount of physical discomfort that participants felt in the exam room (M = 2.81, SD = 1.61) compared to the reception area (M = 2.84, SD = 1.52), \(t(378) = 0.20, p = .839\).

Against our expectations, there was also no significant difference in the desire for goal closure in the exam room (M = 5.17, SD = 1.36) compared to the reception area (M = 5.24, SD = 1.34), \(t(378) = 0.49, p = .625\). This is a limitation of the results, though we note the means for both conditions were high, which suggests that people were generally eager to finish any wait at a doctor’s appointment.

Additionally, there was no significant difference in how close participants’ perceived they were to the start of the appointment in the exam room (M = 4.61, SD = 1.36) compared to the reception area (M = 4.58, SD = 1.33), \(t(378) = 0.18, p = .857\). This suggests participants may have been answering different questions about what constitutes the start of the appointment in each of the conditions. Specifically, in the exam room participants may have considered the doctor entering for the checkup as the start of the appointment, while in the reception area participants may have considered going to the exam room as the start of the appointment. Different interpretations about the start of the appointment may also explain why we did not find a difference in participants’ eagerness to start the appointment in the desire for goal closure index.

In Study 5, we found that participants experienced more impatience and became frustrated faster when waiting for an appointment to start in the exam room than in the reception area. One limitation of this study is that we did not find a difference in participants’ stated desire for goal closure in the exam room and the reception area. Still, the results suggest that considering the desire for goal closure can improve the design of medical waiting periods to minimize impatience, such as by reducing the amount of time spent waiting in the exam room as opposed to the reception area.

10. General discussion

Across five studies, we explored how people’s desire for goal closure affects impatience in the domain of health decisions. We find that the desire for goal closure can increase impatient decisions and heighten the experience of impatience while waiting. That is, people choose to receive worse medical devices and procedures in order to achieve goal closure. Additionally, when the desire for goal closure increases—as a function of getting closer to goal completion—people experience greater impatience. We propose that considering the desire for goal closure can improve the design of medical waiting periods to minimize impatience. The desire for goal closure influenced two aspects of patience. First, participants were impatient in intertemporal choice (i.e., they selected a worse device and procedure) when it allowed for earlier goal closure. Second, participants experienced more impatience (i.e., they felt more emotional discomfort, agitation, and frustration while waiting) the closer they were to completing the wait. We believe that studying impatience as an experience is critical and should be incorporated in future work. While previous literature mainly studied impatience in intertemporal choice (Ainslie & Haslam, 1992; Frederick et al., 2002), it has inevitably left out a large part of what being patient entails. People
are often required to wait, either because they have no other alternatives or because they already chose the larger-later option in an intertemporal choice. The experience of waiting has the potential to influence both people’s well-being and decision-making. Indeed, we recently found that the chronic experience of impatience (Schnitker, 2012) predicted everyday decisions about health habits. People who reported more chronic impatience in everyday life were less likely to engage in healthy habits, including going to the doctor for regular check-ups and vaccinations (Roberts & Fishbach, 2020). It is thus vital to understand the factors that influence people’s experience of waiting along with their decision to wait.

Our findings reveal a novel cause of impatience. Research on intertemporal choice considers patience as an individual’s ability to resist the temptation of the smaller-sooner reward (Duckworth et al., 2013; Mickel et al., 1989), uncertainty that the larger-later reward will materialize (Kidd et al., 2013; McGuire & Kable, 2013; Michaelson & Munakata, 2016), and perception that the larger-later reward is worth waiting for (Dui & Fishbach, 2013; Roberts et al., in press). In the domain of health, impatient decisions are often thought to be the result of an individual’s ability to resist immediate temptations, such as resisting an indulgent treat in favor of a healthier food choice or refraining from smoking a cigarette despite its visceral temptation (Loewenstein, 1996; Urminksy & Zauberman, 2017). However, many impatient health decisions are not driven by the appeal of the immediate temptation. Take for example, the preference to receive a more painful medical procedure sooner over a less painful procedure later. In this situation, impatience is in part due to an individual’s desire to achieve closure on a goal. Thus, we contribute theoretical insights into what it means to be patient, which may extend beyond the domain of health. Patience is possibly the outcome of low desire to achieve closure on a goal.

Finally, our findings offer practical implications for designing wait areas and procedures in medical situations. We find that situations that lead people to have a strong desire for goal closure cause them to feel more impatient. While it may be difficult to control the overall wait time at a medical facility, simple steps still can be taken to reduce patients’ experience of impatience while waiting. For example, medical facilities can reduce the amount of time patients spend waiting in the exam room versus the reception area or have patients complete administrative tasks, such as updating pharmacy information at the beginning of the appointment when the desire for goal closure is low. Reducing people’s experience of impatience while waiting for health care is important, as it may lead people to be less reluctant to visit the doctor for preventative care or to keep up to date with their vaccinations. Indeed, implementing changes to reduce patients’ desire for goal closure can improve both their emotional wellbeing while at the appointment, adherence to regular health habits, and evaluations of the medical care.

10.1. Limitations and boundary conditions

Across our studies, we explore one specific manipulation of the desire for goal closure: the proximity to finishing a task. We chose to focus on this manipulation because it is a common factor that influences the motivation to achieve closure. However, other factors that influence the desire for goal closure may also increase impatience. For example, we predict that people will be more impatient when keeping the task on their mind is particularly difficult or unpleasant, such as when they are concerned they will forget about it. Future studies should explore how other manipulations of the desire for goal closure impact patients’ patience.

Another way that the desire for goal closure may increase impatience is by amplifying the opportunity cost of the wait. People cannot typically achieve closure on other tasks while they are waiting. Therefore, if they have a high desire for goal closure on other tasks, the opportunity cost of the wait may be more salient. For example, a student who is close to completing a homework assignment may be particularly impatient when waiting to receive a flu vaccine at the student health center, because the opportunity cost of waiting is high (i.e., they cannot finish the assignment while they wait). People may be more likely to experience impatience when the opportunity cost of waiting is high.

Additionally, in many of our studies (i.e., Studies 2–5) we explore people’s attitudes about impatience rather than their actual experience of waiting in medical situations. Understanding attitudes about impatience is important because they predict people’s decision-making and evaluations of their medical care. While in Study 1 we found that the desire for closure influences impatience in an incentive-compatible task, future research should continue to explore people’s experience of waiting during real waits for medical procedures.

Finally, while we focus on how the desire for goal closure can impact patients’ health decisions and experiences, there are many common situations that influence the desire to achieve closure on a goal—and subsequently patience—outside of health care. For example, people may feel more impatient when waiting at the front of a line or on an airplane when it lands, compared to at the back of a line or before the airplane leaves, because they are closer to achieving closure on the wait or the flight. As a result, our findings make predictions and recommendations that extend beyond the domain of health. Future research should continue to explore how the desire for goal closure impacts impatience in other common situations outside of health care.

10.2. Conclusion

People are more impatient when they desire closure on a goal. That is, the desire to check a health goal “off the list” (i.e., achieve closure) influences health decision-making as well as people’s experience of waiting for health care. Considering the influence of the desire for goal closure on impatience can improve patients’ health decisions and experience of waiting for health care.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Participant attrition for studies 1–5

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dropouts</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1 (N = 401)</td>
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<td></td>
</tr>
<tr>
<td>Inferior product sooner</td>
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</tr>
<tr>
<td>Simultaneous products</td>
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<td>1.00%</td>
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<tr>
<td>Study 2 (N = 201)</td>
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<tr>
<td>Painful treatment sooner</td>
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</tr>
<tr>
<td>Simultaneous treatments</td>
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<td>0.45%</td>
</tr>
<tr>
<td>Study 3 (N = 401)</td>
<td></td>
<td></td>
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</tbody>
</table>

(continued on next page)
Appendix B. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.obhdp.2020.09.004.

References

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