Organizational Behavior and Human Decision Processes 121 (2013) 256–266

Contents lists available at SciVerse ScienceDirect

Organizational Behavior and Human Decision Processes

journal homepage: www.elsevier.com/locate/obhdp

When waiting to choose increases patience

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ARTICLE INFO

Article history:
Received 7 September 2011
Accepted 23 January 2013
Available online 20 February 2013
Accepted by Harris Sondak

Keywords:
Waiting
Intertemporal choice
Perceived value
Patience

ABSTRACT

We explore how waiting to choose influences patience. We propose that waiting to make an intertemporal choice increases the assumed value of the items for which people are waiting, leading them to become more patient. Five studies support this model. Study 1 finds that after waiting to choose, people exhibit greater patience than if they had not waited or before they had started to wait. Studies 2a and 2b find that increased valuation (rather than decreased cost of the wait) mediates the impact of waiting on patience. Study 3 further finds that whereas waiting to choose increases preference for a larger-later (over smaller-sooner) item, it also increases willingness to pay to expedite delivery of a single item. Finally, study 4 shows the waiting effect is stronger for hedonic than for utilitarian products. These studies modify existing theory by identifying the conditions under which waiting to choose can improve patience.

Introduction

Consider a choice between getting the latest model of a cell phone, which will be delivered to one's local store next week, and waiting for a newer model, which will be delivered to the store next month. Would waiting one week to make a decision affect one's choice? More generally, does waiting to make an intertemporal choice influence the content of choice?

Intertemporal choice involves options that spread out over time and differ in value, such that a person faces a dilemma between getting earlier delivery or greater value (Ainslie, 1975; Hoch & Loewenstein, 1991; Loewenstein & Prelec, 1992; Malkoc & Zauberman, 2006; Read, 2001; Soman, 1998; Thaler, 1981; Trope & Liberman, 2003; Zauberman, Kim, Malkoc, & Bettman, 2009). Intertemporal choices can present an option that is available sooner but is less valuable than another option. Alternatively, intertemporal choices can take the form of choosing whether to pay a premium to get the same option sooner rather than later. In intertemporal choice, patience is the preference for delayed over immediate consumption (i.e., delayed gratification). The patient individual is the one who compromises on time to get a better product or save money (Ainslie & Haslam, 1992; Frederick, Loewenstein, & O'Donoghue, 2002).

This research examines how waiting to make an intertemporal choice affects preference for delayed gratification, that is, patience. We propose that the experience of waiting, even when it is illusory, leads people to infer the options for which they are waiting are more valuable, which in turn influences their patience in choice. We detail our model and the empirical support in what follows.

Patience in intertemporal choice

Intertemporal choice poses a dilemma between immediate gratification and the possibility of greater benefits in the future (Ainslie & Haslam, 1992; Thaler, 1981). In this dilemma, patience—that is, people's ability to delay gratification and opt for the larger-later option—is one of the key predictors of cognitive and social competence (Metcalfe & Mischel, 1999). For example, in a longitudinal study, Mischel, Shoda, and Rodriguez (1989) showed that children who were able to delay gratification longer at the age of four achieved higher scholastic performance and coping better with frustration and stress. Because waiting is difficult, people invoke a variety of mechanisms to overcome the cost of waiting, and choose the larger-later option while forgoing the temptation of an immediate reward (Fishbach & Converse, 2010; Kivetz & Simonson, 2002; Kuhl & Beckmann, 1985; Loewenstein, 1996; Rachlin, 2000; Wertenbroch, 1998). A major insight from intertemporal choice research is that temptations are easier to overcome from a temporal distance. People are better able to commit to a larger-later option over a smaller-sooner option far in advance compared with a short time in advance (Ainslie, 1975; Ainslie & Haslam, 1992; Frederick, Loewenstein, & O'Donoghue, 2002). This "common difference effect" states that people are less concerned about delays in the future than about those in the present (Green, Fristoe, & Myerson, 1994; Kirby & Herrnstein, 1995; Solnick, Kannenberg, Eckerman, & Waller, 1980). For example, a person might prefer two apples in 101 days over one apple in

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0749-5978/$ - see front matter
http://dx.doi.org/10.1016/j.obhdp.2013.01.007

100 days, but once 100 days are removed from both alternatives, the person prefers one apple today over two apples tomorrow. In other words, the person is more impatient when choosing for the near future.

Researchers offer several explanations for the lower patience for options in the near (versus distant) future. Read (2001) suggests subadditivity: people's discount rates are lower for longer than for shorter intervals; therefore, the further away the options are, the smaller the impact the additional wait for the larger-later option will have on diminishing its value. Zauberman et al. (2009) propose that people are less sensitive to duration change in the future than in the near distance. This differential sensitivity to time is shown to underlie the different discount rates for the near- and the distant-future outcomes. Finally, Ebert and Prelec (2007) argue that people do not give sufficient attention to waiting intervals that are in the distant future compared with the near future; therefore, distant future intervals are less likely to diminish patience.

The above lines of research explain why people exhibit greater patience when making distant-future compared with near-future decisions. However, how waiting experience influences the way a person resolves the intertemporal choice dilemma is yet unclear. Possibly, a waiting period diminishes patience because after waiting to choose, the otherwise distant-future options become closer as time has passed; such near-future perspective usually leads to less patience in choice. Recent findings cast doubts on this prediction (Read, Frederick, & Airoldi, 2012; Sayman & Onculer, 2009) and lead us to predict that contrary to the above intuition and depending on the nature of the intertemporal choice dilemma, a waiting period can increase patience. Because waiting is costly, we predict that a completed waiting period changes a person's valuation of the choice options, which systematically affects intertemporal preference.

Waiting matters

Waiting is often a negative experience (though there are exceptions, e.g., when savoring an upcoming positive outcome [Loewenstein, 1987] or postponing one to create an improving sequence [Loewenstein & Prelec, 1991]). People's choices and judgments reflect their desire to justify the negative experience. For example, when people have to wait for non-instrumental information, they often treat this information as if it were useful and let it affect their decisions. At times, they might even choose an otherwise "second option" just because they waited for information that supported this less desirable option, and therefore conclude it is valuable (Bastardi & Shafir, 1998; Redelmeier, Shafir, & Aujla, 2001; Van de Ven, Gilovich, & Zeelenberg, 2010).

Waiting matters because it is mentally costly. Once people have waited, they wish to justify the negative experience by boosting the perceived value of an outcome. This process is consistent with the predictions of cognitive dissonance (Festinger, 1957) and self-perception theory (Bem, 1972). Based on cognitive dissonance theory, people need to justify a painful experience (e.g., waiting) by increasing the perceived value of a waited-for outcome, and self-perception theory argues that people infer from observing themselves investing effort that they value the outcome. These theories further attest that greater perceived value from effort is more likely if individuals believe they are freely choosing to incur costs rather than complying with an external request. For example, only when participants believed they had freely chosen to express some unpopular attitudes did their personal beliefs change to align with what they had expressed (Brehm, 1956; Festinger, 1957). However, more recent research suggests incurring negativity increases valuation even in the absence of freedom of choice, as long as the absence of free choice is not the focus of attention (Arkes & Ayton, 1999; Arkes & Blumer, 1985; Finkelstein & Fishbach, 2010). For example, people value a fixed amount of money more when it is hard earned than when it comes as a windfall (Thaler, 1985).

In an intertemporal choice, the impact of waiting on increased valuation of choice options might have further consequences for the content of choice. To explore this impact, we distinguish between two types of intertemporal choice dilemmas. First, people can face a choice between two options that vary in time and value. For example, they choose between a small box of chocolate in a few days and a large box of chocolate in many days. Second, people can face a choice of whether to pay a premium to expedite delivery of a single option. For example, for the same box of chocolate, they choose between receiving a free, delayed delivery and paying for an expedited delivery. These dilemmas pose different tradeoffs: in the first, two-reward decisions, people compromise on time to get a better option (e.g., more chocolate), whereas in the second, one-reward decisions, they compromise on time to save money (e.g., delivery costs). We predict that waiting to choose affects patience according to these specific configurations of the intertemporal choice dilemma.

Two-reward situations: waiting increases patience

In two-reward situations, if waiting increases the value of the waited-for options, it should lead people to infer that both choice options (the smaller-sooner and larger-later) are more valuable after they have waited than before, and hence the category becomes more valuable. Then once the category becomes more valuable, the decision task becomes more important such that people elaborate more on the choice options in order to arrive at a better decision. The result is an increase in perceived difference in the value of the options in a process of polarized evaluations (Monroe & Read, 2008; Tesser & Conlee, 1975), which leads to a preference for the larger-later option.

For example, people who identify themselves as "computer geeks" value computers more than others and thus have greater motivation to make a well-informed computer choice. As a result, they perceive a greater difference between more and less expensive models and spend more resources on getting better computers than those who value computers less. Indeed, consistent with the prediction that an increase in category value increases preference for a superior option, research on the "magnitude effect" shows that a proportional increase in value of two positively valenced alternatives increases the preference for the more valuable alternative (Thaler, 1981).

We thus predict:

H1. In a two-reward intertemporal choice, patience increases if people have waited to make their choices.

This hypothesis should hold as long as the person is actively waiting (i.e., has not given up or forgot) and as long as the need is constant, for example, when waiting for a money prize as opposed to a medical remedy for an increasing discomfort. The increase in valuation as a result of waiting to choose should underlie this effect. Specifically, a waiting period should increase the (a) perceived value of the options and hence the product category, (b) perceived importance of the decision task, and (c) perceived difference between the value of the smaller-sooner and the larger-later options (i.e., polarized evaluation). Each of these value-related variables should mediate the effect of waiting periods on increased preference for larger-later options over smaller-sooner options.

One-reward situations: waiting decreases patience

When moving to one-reward situations, the implications of inferring value from waiting changes. Because people value products more after they have waited for them, we predict they will be less willing to delay a reward if they have waited to decide on the delivery than if they have not. For example, a "computer geek" would be willing to pay a higher price to expedite delivery of a computer than a person who likes computers less. If waiting increases liking for computers, thus making people a bit more like "computer geeks," those who have waited to decide on the delivery would be more willing to pay a premium to expedite it.

Because people are willing to pay more for expediting a more valuable product, waiting would decrease patience. Our hypothesis is therefore:

H2. In a one-reward intertemporal choice, patience decreases if people have waited to make their choices.

Notably, we expect decreased patience from waiting in a one-reward intertemporal choice when the expediting currency people need to pay is different from the waited-for category, for example, when paying money to expedite delivery of chocolate. We propose that waiting increases valuation of the product (e.g., chocolate) but not the expediting currency (e.g., money).

Comparing the impact of waiting to make a choice in one- (versus two-) reward situations not only provides a complete model of the influence of waiting on intertemporal choice, but it further helps us rule out an alternative cause of our predicted effects, namely, that waiting decreases the perceived cost of additional delays. An increase in patience after waiting would reflect a lower cost of delays if people learned waiting was less painful than they initially thought, or if they inferred they were the type of person who can wait. In both cases, the cost of additional wait decreases and patience increases. A related explanation refers to sunk-cost effects: those who have waited for a product for a period of time might feel more committed to continuing to wait to justify the "sunk" waiting period (Arkes & Ayton, 1999; Arkes & Blumer, 1985; Koo & Fishbach, 2010). These inferences of lower cost of time delays could explain why waiting increases patience; thus a cost-inference explanation makes a prediction similar to ours for the two-reward situation. However, in the one-reward situation, a cost-inference explanation would predict waiting will increase patience, and we predict waiting will decrease patience. Thus if we find different effects under one- and two-reward situations, changes in the perceived cost of time delays are unlikely to account for our phenomenon. Instead, we suggest that after waiting, people will value the product more such that they will wait longer for a superior option and will wait less for the same option by paying a premium to expedite delivery.

Our analysis further implies a greater impact of waiting on patience for hedonic products than utilitarian products. Previous research suggests people are more certain about their need and goals when choosing utilitarian products rather than hedonic products (Dhar & Wertenbroch, 2000; Koo & Fishbach, 2008; Wertenbroch, 1998). We accordingly expect hedonic products to be more affected by situation cues, including waiting periods, than utilitarian products.

The current research

Five studies test the effect of real and illusory waiting experiences on patience in intertemporal choice. In Study 1, we used two-reward decision tasks in three conditions that tested for H1. In the first condition, participants made a choice between two options that were in the near future (e.g., in 3 day versus 23 days). In the second condition, participants made a choice between two options that were in the distant future (e.g., in 30 days versus 50 days). These two conditions were standard near- and distant-future conditions used in research on the common difference effect. The only difference between the two conditions is the temporal distance from the point of decision to the time when the options are available. In the third condition, participants learned about the options when they were in the distant future but waited until they were in the near future to make the decision. This is the *waiting condition*.

The comparison between the first two conditions is a direct test of the common difference effect. This comparison is not the focus of the current research but a good benchmark to gauge how waiting affects intertemporal preference. The comparison between the near-future condition and the waiting condition tests the effect of waiting because participants face exactly the same decision, except that in the waiting condition, participants have waited to make their choices. The comparison between the distant future and the waiting condition is also of interest. If participants are more patient after they have waited than before, we can conclude that in our design, the effect of waiting on increased patience is greater than the effect of near- (versus distant-) future decisions on decreased patience (i.e., lower self-control for near temptations as in the common-difference effect).

In Studies 2a and 2b, we use a similar design as in Study 1 to test whether changes in evaluation of the product category (rather than changes in perceived cost or length of the wait) underlie the effect of increased patience in two-reward intertemporal choices. Study 3 compares one- and two-reward decision tasks to assess H2 and further support the notion that increased valuation underlies increased patience. In the one-reward condition, participants choose whether to pay a premium to expedite delivery, whereas in the two-reward condition they choose between different products. We predict that making participants perceive the waiting period as longer (i.e., illusory wait) will decrease their patience in the one-reward condition but increase it in the two-reward condition. Finally, in Study 4, we test the moderating role of product characteristics (i.e., utilitarian versus hedonic).

Study 1: when waiting increases patience

Study 1 examines whether a waiting period increases preference for a larger-later over a smaller-sooner reward. To test this hypothesis, we presented participants with a choice between two monetary rewards in one out of three conditions: (1) near-future: a small reward in 3 days versus a large reward in 23 days; (2) distant-future: a small reward in 30 days versus a large reward in 50 days; and (3) waiting: participants learned about the distant-future options and that they would make a choice after 27 days. After the 27-day wait, participants chose between a small reward in 3 days versus a large reward in 23 days (i.e., the original distant-future options became the near-future options). We thus operationalized waiting as learning about the options when they are in the distant future but making selections when the options are in the near future. Congruent with prior research (Kirby & Herrnstein, 1995), we expected a greater preference for the larger-later option when the options were situated in the distant (versus near) future. More importantly, however, we hypothesized that a waiting period increases preference for the larger-later option beyond the distant and near-future conditions.

Method

Participants

Ninety-eight undergraduate students (50 women) from a large Midwestern university participated in an online study in return for an opportunity to win a monetary reward. Eleven participants did not finish the study and three responded after the deadline for participation, leaving us with 84 valid participants, which were distributed equally across the three conditions.

Procedure

This study used a 3 (choice: near future versus distant future versus waiting) between-subjects design. The dependent variable was preference for a larger-later reward over a smaller-sooner reward.

All the participants received an invitation to sign up for an online subject pool that would send them invitations to participate in future studies. In return for signing up, they could enter one of two lotteries with an equal chance of winning a monetary reward. These lotteries varied in terms of both amount and delivery date and constituted the experimental manipulation. They are specified below:

(1) In the near-future condition, participants chose between (a) $50 delivered in 3 days and (b) $55 delivered in 23 days.
(2) In the distant-future condition, participants chose between (a) $50 delivered in 30 days and (b) $55 delivered in 50 days.
(3) In the waiting condition, participants read about two choice options (a) $50 delivered in 30 days and (b) $55 delivered in 50 days (similar to the distant-future condition), but they did not need to make any choice right away. These participants read that because the options were still far away, they did not need to choose right way. They would receive a note from the experimenter in 27 days asking them to choose. After 27 days elapsed, an experimenter contacted these participants again and they indicated their choices. Note: at that time, participants were facing options identical to those in the near-future condition.

Because the date of choice (e.g., proximity to weekend) might affect the content of choice, participants in the near-future condition received the study notification 27 days later than those in the other two conditions, such that everyone made their choices on the same date. On that date, participants had 24 h to indicate their choice. Participants in all conditions read that their chance of winning would be the same regardless of which option they chose. Participants therefore only needed to consider the trade-off between time and money when making their choices. After the experiment, two participants received their selected reward in a lottery.

Results and discussion

The preference for the larger-later reward over the smaller-sooner reward, which indicates patience, varied across conditions, $\chi^2(2, N = 84) = 17.43$, $p < .001$ (see Fig. 1). Specifically, in support of our hypothesis, 85.71% of the participants in the waiting condition chose the larger-later option, which is more than the 55.56% who chose this option in the distant-future condition, $\chi^2(1, N = 55) = 6.06$, $p < .01$, and more than the 31.03% who chose this option in the near-future condition, $\chi^2(1, N = 57) = 17.47$, $p < .001$. In addition, the percentage of participants choosing the larger-later option was directionally higher in the distant-future than in the near-future condition, $\chi^2(1, N = 56) = 3.43$, $p = .07$.

These results demonstrate that waiting increases patience in intertemporal choice (H1): although participants in the waiting condition faced the same choice options as those in the near-future condition, they were more likely to choose the larger-later reward. Moreover, those who waited to choose were more likely than those in the distant-future condition to choose the larger-later reward. This latter effect suggests the gain in patience from the waiting experience is greater in magnitude than the loss in patience associated with a near-future perspective (i.e., the common difference effect). More importantly, that participants who waited were more patient than those in the distant-future condition further rules out the possibility that a waiting period simply allowed participants to make their choices in advance and then wait to report them, in which case they should have been as patient as those choosing for the distant future. Though participants may have made preliminary choices in advance, when the options were initially presented, these participants could revise their private choices and indeed, their final choices were different than those in the distant-future conditions. We conclude that waiting increased patience more than making a choice for the distant future.

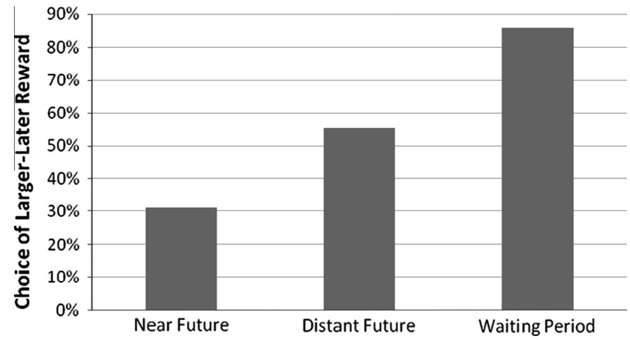

Fig. 1. Percentage of participants choosing the larger-later reward as a function of choice conditions.

Study 1 provides the first piece of evidence that waiting increases patience in a two-reward decision task. We propose that waiting increases the perceived value of the waited-for items, which in turn affects patience. We conducted our next study to test for this underlying mediator. To assess participants' subjective evaluations, we replaced the monetary rewards with consumer products.

Study 2a: changes in valuation mediate the increase in patience

Participants in the study indicated their choice between two consumer products (iPod shuffles) that correspond to smaller-sooner and larger-later rewards, in one of three conditions: near future, distant future, and waiting. We predicted that waiting to choose influences evaluation such that it increases (a) the perceived value of the product category, (b) the importance of the decision task, and (c) the perceived value difference between the larger-later and the smaller-sooner option. These evaluative measures should in turn mediate the effect of waiting on increased patience.

We followed this study with a study that tested whether waiting to choose also decreases the subjective cost of waiting or the perceived length of the time interval. Presumably, each of these effects could account for the wait effect on patience in addition to or instead of our value-based explanation.

Method

Participants

One hundred and fifty-seven undergraduate students (84 women) from a larger Midwestern university participated in an online study in return for an opportunity to win a prize. Eight participants did not finish the study and five responded after the deadline for participation, leaving us with 144 participants, which were equally distributed across conditions.

Procedure

This study employed a 3 (choice: near future versus distant future versus waiting period) between-subjects design with random assignment. The dependent variable was preference for a larger-later reward over a smaller-sooner reward.

As in Study 1, participants received an invitation to sign up for an online subject pool that would send them invitations to participate in future studies. In return for signing up, they entered a lottery to win an iPod shuffle. Specifically, participants had to choose between two models of an iPod shuffle, available at different times in one of three conditions:

(1) In the near-future condition, participants chose between (a) a regular model with a list price of $69.99, delivered in exactly two days, and (b) a superior model with a list price of $74.99, delivered in exactly 27 days.
(2) In the distant-future condition, participants chose between (a) a regular model with a list price of $69.99, delivered in exactly 15 days, and (b) a superior model with a list price of $74.99, delivered in exactly 40 days.
(3) In the waiting condition, participants read about the same options as in the distant-future condition but did not need to make their decision right away. They read that the experimenter would contact them in 13 days, at which point they would have to choose. After 13 days elapsed, participants indicated their choices. Note: at that time, they were facing the same options as those in the near-future condition.

To hold the date of choice constant, we sent the study notification to participants in the near-future condition 13 days later than we sent it to those in the other two conditions. Participants in all conditions saw pictures of the two iPod shuffles and read product specifications, including market price, which suggested the superior model had a few additional features. They further read that several participants would be randomly drawn to receive the option of their choice at the specified date. To ensure wait durations were identical within each condition, we required all participants to indicate their choices within 24 h of receiving the email notification.

After submitting their choices (via email), participants received a second survey that assessed the perceived value of the iPod shuffle. Notably, because expressing their evaluations prior to choosing could potentially bias choice, participants completed the survey only after they had made their choices. This order raised the possibility that choice would influence evaluation such that participants would generate evaluations that justified their choices. To decrease (though not eliminate) such influence, we assessed evaluations one day after participants submitted their choices, at a point when they could be less concerned with choice justification via evaluations.

The survey assessed the evaluation of the product category (iPods), the importance of the choice task, as well as the perceived value difference between the two options. To measure evaluation of the iPods category, we asked participants to (1) rate how much they liked iPod shuffles (1 = *not at all*; 7 = *very much*), (2) rate how much fun it was for them to use an iPod shuffle (1 = *not fun at all*, 7 = *very much fun*), and (3) indicate the highest dollar amount they would be willing to pay for (a) the regular model and (b) the superior model if they were available immediately, with no waiting period. This last item measured participants' willingness to pay for an immediately available product; thus it assessed the value of the products rather than the value of the products conditioned on the time delay. We used the sum of the willingness to pay for the two models to measure perceived value of iPods.

To measure the importance of the decision task, participants rated the extent to which (1) winning an iPod shuffle was important for them (1 = *not important at all*, 7 = *very important*) and (2) getting a superior model of the iPod shuffle was important for them (1 = *not important at all*, 7 = *very important*). These importance measures refer to the specific lottery situation and they are different from the category value measures, which refer to iPods in general. To measure value difference between the larger-later and the smaller-sooner option, we calculated the difference of the willingness to pay measures above (item (3) of the category value measure).

Results and discussion

Choice results

Participants' preference for the larger-later over smaller-sooner option (i.e., patience) varied between conditions, $\chi^2(2, N = 138) = 11.23$, $p < .001$ (see Fig. 2). In support of our hypothesis, 59.57% of the participants in the waiting condition chose the larger-later option, which is more than the 37.25% who chose this option in the distant-future condition, $\chi^2(1, N = 98) = 4.88$, $p < .05$, and more than the 26.09% who chose this option in the near-future condition, $\chi^2(1, N = 98) = 10.64$, $p < .01$.

Similar to Study 1, participants' preference for the larger-later option was directionally but not significantly higher in the distant- than in the near-future condition, $\chi^2(1, N = 97) = 1.38$, $p = .25$.This pattern of result is possibly due to the fact that in both studies, the two options were close enough in value (around $5) that unless participants waited to choose, they perceived little difference in value, which did not justify delaying the delivery for an additional 25 days (20 days in Study 1). Only when participants waited to choose did the value difference increase to the point where many chose to delay the delivery to receive a better model.

Evaluative measures

Next, we analyzed participants' evaluations of the choice options (see Table 1). Among 144 participants who made a choice, 108 completed the second evaluation survey that was not required for entering the lottery. The response rate was similar across conditions (78.3%, 76.5%, and 70.2%). We first calculated perceived value of the product category by standardizing the three category value measures and then averaging them (Cronbach's $\alpha = 0.74$). Analysis of this variable revealed a directional though not significant effect for condition, $F(1, 105) = 2.59$, $p = .08$. In support of our predictions, participants expressed more positive evaluations of the iPod category in the waiting condition ($M = .28$, $SD = .74$) than in the distant-future condition ($M = -.049$, $SD = .80$), $t(70) = 1.82$, $p = .07$ (insignificant but directional), and the near-future condition ($M = -.13$, $SD = .85$), $t(66) = -2.16$, $p = .034$. Their evaluations of the choice options in the distant- and near-future conditions were similar to each other, $t(72) = -.44$, $p = .66$.

We next calculated the importance of the decision task by averaging the two relevant items, $r = 0.61$, $p < .001$. Analysis of this variable revealed that participants perceived the decision task as more important in the waiting condition ($M = 4.91$, $SD = 1.49$) than in the distant-future condition ($M = 3.93$, $SD = 1.52$), $t(70) = 2.89$, $p = .005$,

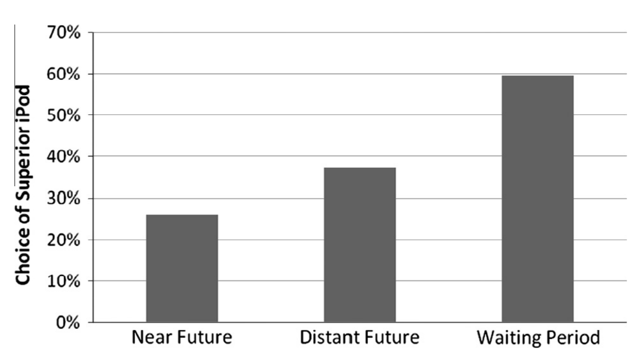

Fig. 2. Percentage of participants choosing the superior iPod as a function of choice conditions.

Table 1
Means and standard deviations (in parentheses) of value measures as a function of intertemporal choice conditions in Study 2a.

	Choice of larger-later option	Near future 26.09%	Distant future 37.25%	Waiting 59.57%[c]
Value of product category	Liking of iPod	4.86 (1.57)	5.15 (1.39)	5.48 (1.39)[a]
	WTP smaller-sooner option*	\$38.56 (23.77)	\$39.44 (21.51)	\$43.45 (23.98)
	WTP larger-later option	\$41.95 (26.29)	\$43.04 (23.12)	\$48.68 (27.19)
Importance of decision task	Importance of winning an iPod	4.08 (2.10)	4.18 (2.08)	4.97 (1.51)[b]
	Importance of getting a superior model	3.50 (1.98)	3.63 (1.58)	4.85 (1.79)[c]
Difference between options' value	WTP difference	\$3.39 (3.91)	\$3.35 (4.35)	\$5.53 (5.83)[a]

Note: For each reported variable, numbers with superscripts are significantly different from the near-future condition (i.e., our comparison standard). Superscript "a" = $p < .10$ level, "b" = $p < .05$, "c" = $p < .01$.
* US Dollars.

and the near-future condition ($M = 3.79$, $SD = 1.92$), $t(67) = 2.73$, $p = .008$. Again, the near- and distant-future conditions were similar to each other, $t(73) = .22$, $p = .83$.

Finally, we calculated the difference in the willingness to pay for each model if it was available immediately, as a measure of perceived value difference. Participants' perceived the value difference between the two iPod models as directionally higher in the waiting condition (M = \$5.53, $SD = 5.83$) than in the distant-future condition (M = \$3.35, $SD = 4.35$), $t(70) = 1.82$, $p = .07$, and the near-future condition (M = \$3.39, $SD = 3.91$), $t(67) = 1.80$, $p = .08$, though these differences were not significant. The perceived value difference was similar in the near- and distant-future conditions, $t(73) = .05$, $p = .96$.

Mediation analyses

We next tested whether each of these evaluation measures mediated the effect of waiting on preference for the larger-later option. To test these predictions, we conducted a series of regressions that compared the waiting condition with the near- and distant-future conditions combined (the no-waiting condition).

We first examined mediation by perceived category value. A regression of choice on the waiting versus no-waiting condition revealed that waiting increased preference for the larger-later option, $\beta = .21$, $p = .026$, and a regression of perceived value on the waiting versus no-waiting condition revealed that waiting increased perceived value of the product category, $\beta = .21$, $p = .027$. A regression of choice on perceived value revealed that perceived value of the product category increased preference for the larger-later option, $\beta = .37$, $p < .001$. Finally, a regression of the waiting versus no-waiting condition on two predictors—choice and perceived value—revealed that waiting did not predict preference for the larger-later option when we included value of the product category in the regression, $\beta = .14$, $p = .14$, Sobel's $z = 1.92$, $p = .027$.

Second, we conducted a similar series of regressions to examine mediation by importance of the decision task. A waiting period increased both perceived task importance, $\beta = .29$, $p = .002$, and preference for the larger-later option, $\beta = .21$, $p = .026$. Furthermore, perceived task importance increased preference for the larger-later option, $\beta = .34$, $p < .001$. The effect of a waiting period on preference for the larger-later option decreased when we included the perceived task importance in the regression, $\beta = .13$, $p = .19$, Sobel's $z = 2.22$, $p = 0.013$.

Finally, a similar set of regressions examined mediation by the perceived value difference and it revealed a similar pattern. Waiting increased value difference, $\beta = .30$, $p = .002$, which in turn increased preference for the larger-later option, $\beta = .33$, $p < .001$. Waiting period was no longer a predictor of preference for the larger-later option when we included value difference in the regression, $\beta = .15$, $p = .11$, Sobel's $z = 1.79$, $p = .037$.

The mediation analyses provide support for the perceived value account. That is, waiting increased the perceived value of the product category, the perceived importance of the decision task, and the perceived value difference between the two options. Each of these variables in turn caused greater preference for the larger-later option.

Study 2b: does waiting also decrease the perceived cost and length of additional wait?

Waiting to make a choice may increase the perceived cost or length of the wait. Presumably, after waiting, individuals may have learned the subjective cost of an additional wait is lower than they would have originally anticipated. In addition, individuals' time perception may have changed, such that the additional wait appears subjectively shorter after they have waited. In a follow-up study, we tested for these possible influences of waiting to choose and whether they underlie our effect on patience.

Our follow-up study used a similar design with a different set of stimuli. Participants ($N = 145$ from a large university in Hong Kong) chose between a small (12 pieces) and a large (16 pieces) box of Godiva chocolates. In the near-future condition, participants chose between (a) a small box in 5 days and (b) a large box in 35 days. In the distant-future condition, participants chose between (a) a small box in 15 days and (b) a large box in 45 days. In the waiting condition, participants learned about the same options as in the distant-future condition but were invited to choose only after waiting 10 days. Note: at that time, participants in the waiting condition were facing the same options as those in the near-future condition.

After indicating their choices, participants rated the value of the chocolate category, the perceived cost of waiting, and the subjective length of the wait (we counterbalanced the order of these indexes). Thus they evaluated the chocolate category: (1) how much they liked chocolate (1 = *not at all*; 7 = *very much*), (2) the highest dollar amount they would be willing to pay for (a) a 12-piece box of Godiva chocolate and (b) a 16-piece box of Godiva chocolate if they were available immediately, with no waiting period. Again, we used the sum of the willingness to pay for the two items to measure the perceived value of Godiva chocolate. Participants further rated the perceived cost of waiting: the extent to which (1) waiting one additional day for delivery is… (1 = *very easy for me*, 9 = *very difficult for me*), (2) each additional waiting day is… (1 = *rather painless*, 9 = *very painful*), and (3) I am the kind of person who… (1 = *do not care about delivery speed*, 9 = *cares a lot about delivery speed*). Finally, participants rated the subjective time intervals: (1) waiting 30 days for a delivery feels like… (1 = *a short period*, 9 = *an extremely long period*) and (2) a day's waiting feels like… (1 = *a short wait*, 9 = *a long wait*).

We present the results in Table 2. Participants' choices and evaluations across waiting conditions replicated our previous studies. The value assigned to the options further mediated the effect on choice (Sobel's $Z = 2.05$, $p = .020$). In contrast and consistent with our predictions, we did not find effects on perceived cost and time interval measures (all ps > .06). These measures further did not mediate the effect of waiting on choice. These results suggest the perceived value account we proposed was a more powerful predictor of the effect of waiting on choice than the other explanations.

We hypothesize changes in valuation of the options cause the impact of wait on patience. It follows that we should expect a decrease in patience in one-reward decision tasks, when contemplating whether to pay a premium to expedite the delivery of a reward. After waiting to make their choices, people should be more willing to pay a premium to receive an item sooner because they value it more. In the next study, we compare one-reward to two-reward decision tasks to explore when waiting to choose decreases versus increases patience.

In addition, in Study 1 and 2, we manipulated actual wait. However, the length of a waiting period is often subjective and can depend on the person's perception of when exactly she started waiting. For example, a person ordering a product online might construe the waiting period for receiving the product as beginning at the point when she completed the purchase, when she initially decided to buy the product, or when she first heard about the product. Each of these points will introduce a different-length waiting period, which, according to our model, should affect the person's willingness to wait longer for an improved version of that product. In our next study, we accordingly test whether, when they perceive they have been waiting a long time, people become more patient when choosing between two rewards and less patient when choosing whether to expedite delivery of a single reward.

Study 3: illusory wait and patience in one- versus two-reward decision tasks

Study 3 manipulated the perception of wait, that is, participants' subjective experience that they have been waiting for a short versus a long time. Studying perceived wait allows us to separate the effect of waiting from elaboration: we can demonstrate that having time to consider the options is not necessary for the effect of waiting periods.

Participants in this study chose from among assortments of popular gourmet chocolate truffles (Godiva). Because everybody in our sample had tasted this brand before, we could construe the waiting period as beginning either at the point they had last eaten Godiva chocolate (e.g., last month) or at the point we presented the reward options (i.e., during the study session). Participants in a two-reward condition indicated their choice between a small box of Godiva chocolates to be delivered sooner and a large box to be delivered later. Participants in a one-reward condition indicated their choice between a box of Godiva chocolates to be delivered later for no extra money or sooner for a small premium. We predicted that perceived longer waiting would increase patience among participants choosing between a smaller box now and a larger box later; they should be willing to wait longer for the larger box. But perceived longer wait should decrease patience among participants choosing between a single box of chocolates now or later; they should be more willing to pay a premium to get the chocolates now.

Method

Participants

Two hundred and thirty-nine undergraduate students (111 women) from a larger Midwestern university participated in the study for \$1 monetary compensation.

Procedure

The study employed a 2 (perceived wait: long versus short) × 2 (choice set: one versus two rewards) between-subjects design with random assignment. The dependent variable was preference for a delayed reward.

Participants completed a "chocolate survey" in return for monetary compensation and an opportunity to win a chocolate prize. They first read a short introductory paragraph on Godiva chocolate and indicated whether they were familiar with this brand (yes versus no) and how much they liked Godiva chocolate (1 = *not at all*, 7 = *very much*). To manipulate perceived wait, the survey asked participants in the long-wait condition to indicate the last time they had had Godiva chocolate (1 = *not long time ago*, 7 = *very long time ago*). The rest of the participants in the short-wait condition did not complete this item. This scale item directed participants' attention to a longer temporal frame than in the short-wait condition.

Next, we asked participants in the two-reward condition to choose between two lottery options:

(1) Get 16 pieces of Godiva's signature truffle assortment (\$32) in 48 days.
(2) Get 12 pieces of Godiva's signature truffle assortment (\$24) in 6 days.

We asked the remaining participants, those in the one-reward condition, to choose between the following:

(1) Get 16 pieces of Godiva's signature truffle assortment (\$32) in 48 days.
(2) Pay a \$3 expedition fee to get 16 pieces of Godiva's signature truffle assortment (\$32) in 6 days.

The values in parentheses reflected the product market prices. The \$3 expedition fee made the options similarly attractive. The rest of the instructions were similar across conditions. Participants read that they would enter a lottery in which they could win their

Table 2
Means and standard deviations (in parentheses) of process measures as a function of intertemporal choice conditions in Study 2b.

	Choice of larger-later option	Near future 43.75%	Distant future 65.95%[b]	Waiting 76.00%[c]
Category value	Liking of Godiva	4.77 (1.17)	4.83 (1.42)	5.36 (1.16)[b]
	WTP 12-piece Godiva*	\$129.48 (78.73)	\$120.40 (65.44)	\$173.47 (76.55)[c]
	WTP 16-piece Godiva	\$166.83 (102.11)	\$155.09 (82.62)	\$220.71 (91.55)[c]
Perceived time interval	30 Days is a long period	5.08 (2.22)	5.32 (2.04)	5.18 (2.20)
	A day's waiting feels long	4.15 (2.22)	4.02 (2.19)	3.34 (2.21)[a]
Perceived cost of waiting	Waiting is difficult	4.15 (2.29)	3.60 (2.13)	3.38 (1.96)[a]
	Waiting is painful	4.42 (2.20)	4.26 (2.25)	3.76 (1.95)
	I care about delivery speed	5.38 (1.71)	5.43 (1.80)	4.92 (2.20)

Note: For each reported variable, numbers with superscripts are significantly different from the near-future condition (i.e., our comparison standard). Superscript "a" = $p < .10$ level, "b" = $p < .05$, "c" = $p < .01$.
* Hong Kong Dollars.

gift of choice, and that their choice would not affect their chances of winning. Once the study was completed, two randomly selected participants received their selected Godiva prize in a lottery.

Results and discussion

Manipulation check

A separate group of participants ($N = 27$), sampled from the same population as the main-study participants, completed the perceived-wait manipulation in one of the two conditions (long versus short perceived wait). They then rated the following: (1) the extent to which they had been waiting for an opportunity to have Godiva (1 = *not at all*, 7 = *very much*), (2) the time that had elapsed since they'd had Godiva (1 = *very short*, 7 = *very long*), (3) the last time they'd had Hershey's chocolate (1 = *recent*, 7 = *long time ago*), and (4) the last time they'd had Godiva relative to the last time they'd had Hershey's (1 = *recent*, 7 = *long time ago*). We used the third item as a standard of comparison for answering the fourth item and did not include it in the perceived-wait index.

We averaged the rest of the items into a perceived-wait index (Cronbach's $\alpha = 0.61$). Analysis of this index revealed that those in the long-wait condition indeed believed they had waited for a longer period of time ($M = 4.64$, $SD = 1.75$) compared with those in the short-wait condition ($M = 3.64$, $SD = 1.58$), $t(25) = -2.42$, $p < 0.03$. These results suggest our manipulation of the length of the wait was successful.

Hypothesis testing

All the participants (100%) indicated they were familiar with and liked Godiva chocolate ($M = 5.12$, $SD = 1.54$). The liking ratings were similar across conditions ($F < 1$). Binary logistic regression of participants' preferences for a delayed reward revealed a main effect for waiting, Wald's $\chi^2(1, N = 239) = 4.13$, $p < .05$, indicating that those in the long-wait condition were more likely to choose the delayed reward than those in the short-wait condition, and a main effect of choice set, Wald's $\chi^2(1, N = 239) = 12.22$, $p < .001$, indicating that those in the one-reward condition were more likely to choose the delayed reward than those in the two-reward condition.

These effects were qualified by the predicted perceived wait - $\times$ choice set interaction, Wald's $\chi^2(1, N = 239) = 12.73$, $p < .001$. As we expected (see Fig. 3), in the two-reward condition, 66.10% of the participants chose the delayed reward in the long-wait condition, which is more than the 37.93% who chose this option in the short-wait condition, $\chi^2 = (1, N = 117) = 9.30$, $p < .001$. However, in the one-reward condition, the results were reversed: 52.46% chose the delayed reward in the long-wait condition, which is less than the 70.49% who chose it in the short-wait condition, $\chi^2 = (1, N = 122) = 4.19$, $p < .05$.

Recall that participants in the long-wait condition further rated the amount of time that had elapsed since they had had Godiva chocolate ($M = 4.78$, $SD = 1.56$). These subjective waiting scores should further predict participants' reward choices. Specifically, congruent with the previous results, in the two-reward condition, we found a positive biserial correlation between subjective length of wait and preference for the delayed reward, $r_b = 0.26$, $p < .05$, which suggests the longer the participants believed they had waited, the more likely they were to choose the delayed reward over the immediate one (i.e., larger over the smaller chocolate assortment). In contrast, in the one-reward condition, we found a negative correlation between these variables, $r_b = -0.28$, $p < .05$, indicating that the longer participants believed they had waited, the less likely they were to choose the delayed over the immediate option (i.e., they chose to pay for expedited delivery).

By prompting participants to either think or not think about the last time they had had Godiva chocolate, we were able to manipulate the subjective length of the waiting period. As a result, participants' preference for the larger-later reward changed; thus we were able to affect patience via perceived wait.

Fig. 3. Percentage of participants choosing the delayed reward as a function of perceived wait (long versus short) and choice set (one reward: expediting or not versus two rewards: smaller-sooner or larger-later).

In addition, these results further support our assumption that waiting increases value of options and thereby patience, and they rule out the possibility that waiting increases patience by decreasing the cost of an additional wait. Participants in the long-wait (versus short-wait) condition expressed stronger preference for expediting a one-reward option by paying a premium, which suggests they valued the product more rather than they were less averse to the cost of wait. Notably, people might still learn from waiting that the cost of the wait is lower; however, such inference would need to have a weaker effect than that on perceived value, because those who felt they had waited were more eager to receive the one-reward option as soon as they could.

Because waiting increases the value of options, we should further expect a greater impact on patience when individuals wait for hedonic products than when they wait for utilitarian products. In general, individuals are less certain about their valuation of hedonic (versus utilitarian) products. Therefore, waiting for hedonic products should have a stronger impact on assigning value and patience. We test this assumption in our final study.

Study 4: waiting for hedonic versus utilitarian products

Our first studies utilized hedonic products (e.g., chocolate) and money. Study 4 tests whether the waiting effect is stronger for hedonic products than utilitarian products, because the value of hedonic products is ambiguous and hence people infer value from waiting, and because individuals have an impulsive desire for products that bring immediate hedonic pleasure, and when individuals are already impatient, the potential for waiting to increase their patience is greater. We compared two types of products: hedonic (i.e., chocolate) versus utilitarian (i.e., USB flash drive). We predict that perceived long (versus short) wait will increase patience for chocolates but less so for USB drives.

Method

Participants

Two hundred and thirty-four undergraduate students (147 women) from a large university in Hong Kong participated in the study for a chance to win the product of their choice.

Procedure

The study employed a 2 (perceived wait: long versus short) $\times$ 2 (Product: Utilitarian versus Hedonic) between-subjects design with random assignment. The dependent variable was preference for a delayed reward. We followed Study 3's procedure to manipulate perceived duration of wait. We used chocolate as our hedonic product and a USB flash drive as our utilitarian product.

Participants completed a survey on either chocolate or USB flash drives. After reading some information on their product, to manipulate perceived wait, participants in the long-wait condition rated the last time they had had Godiva chocolate or used a brand-new flash drive (1 = *not long time ago*, 7 = *very long time ago*). The rest of the participants in the short-wait condition did not complete this item.

Next, we asked participants in the hedonic condition to choose between two lottery options:

(1) Get 16 pieces of Godiva's signature truffle assortment (HK$250) in 48 days.
(2) Get 12 pieces of Godiva's signature truffle assortment (HK$200) in 6 days.

Participants in the utilitarian condition chose between two lottery options:

(1) Get a 6-gigabyte Sandisk flash drive (HK$250) in 48 days.
(2) Get a 4-gigabyte Sandisk flash drive (HK$200) in 6 days.

The values in parentheses reflected the product market prices. Participants read that five of them would be randomly selected to receive their selected prize.

Results and discussion

Binary logistic regression of participants' preferences for a delayed reward revealed a main effect for waiting, Wald's $\chi^2(1, N = 234) = 5.41$, $p < .05$, indicating that those in the long-wait condition were more likely to choose the delayed reward than those in the short-wait condition, and a main effect of product type, Wald's $\chi^2(1, N = 234) = 6.24$, $p < .05$, indicating that those in utilitarian-product condition were more likely to choose the delayed reward than those in the hedonic-product condition. Specifically, 60.87% of the participants (70 out of 115) in the utilitarian-product condition chose the larger-later option, which is higher than 43.70% (52 out of 119) in the hedonic-product condition, $\chi^2(N = 234) = 6.91$, $p = .009$.

Next, we examined the perceived waiting effect. We found a waiting effect for the hedonic-product category: 32.76% (19 out of 58) participants in the short-wait condition chose the larger-later option, whereas 54.10% (33 out of 61) in the long-wait condition chose this option, X^2 $(N = 119) = 5.50$, $p = .02$. Participants' choices in the utilitarian-product category showed the same direction but the result was not significant: 56.14% (32 out of 57) participants in the short-wait condition chose the larger-later option, versus 65.52% (38 out of 58) in the long-wait condition, X^2 $(N = 115) = 1.06$, $p = .32$. Notably, the perceived wait $\times$ product type interaction was not significant, Wald's $\chi^2(1, N = 234) = .82$, $p = .37$. Thus, even though the waiting effect is significant for hedonic products and not for utilitarian products, these conditions yielded similar patterns.

General discussion

This paper examines how waiting to make an intertemporal choice increases patience. We proposed that waiting to choose increases perceived value of the choice options, which systematically influences the preference for immediate versus delayed gratification. Specifically, a waiting period increases patience when individuals choose between two options that differ in value and time of delivery, because an increased valuation induces more polarized evaluation of the options and a greater preference for the larger-later option. However, a waiting period decreases patience when individuals choose whether to pay a premium to receive an option sooner, because an increased evaluation increases the desire to get the option.

Five studies support these effects of waiting to make an intertemporal choice. Using monetary rewards, Study 1 shows a waiting period increases the share of choice of a larger-later reward beyond what we observed when the options were presented in the distant future, as in the beginning of the wait, and when the options were presented in the near future, as in the end of the wait. Study 2a demonstrated the mediating role of changes in valuation on increased patience when choosing from among consumer products (iPod shuffle). Study 2b demonstrated that change in valuation is a better predictor of patience than changes to the perceived cost or length of the wait. Study 3 examined the effect of perceived wait on both an increase and decrease in patience. We find that waiting increases patience when people choose between larger-later and smaller-sooner rewards, whereas it decreases patience when people choose whether to pay a premium to receive a reward sooner. Finally, Study 4 documented a stronger waiting effect on intertemporal choice for hedonic than for utilitarian products.

The current findings extend theory and research on intertemporal choice (Frederick, Loewenstein, & O'Donoghue, 2002) and self-control processes (Fishbach & Trope, 2007; Rachlin, 2000; Stroz, 1956; Thaler & Shefrin, 1981). Intertemporal-choice situations often pose a self-control dilemma between pursuing immediate benefits (i.e., temptations) and long-term interests. An underlying assumption in the work on intertemporal choice is that people become impatient as the options get closer in time. Accordingly, self-control research often recommends making intertemporal choices ahead of time to avoid succumbing to temptations once they are presented (Rachlin, 2000; Thaler & Shefrin, 1981; Wertenbroch, 1998). For example, it recommends shoppers commit to waiting for a newer product model ahead of time, before they get to the store and feel tempted to get the latest model.

We replicate the effect on greater patience when both choice options are scheduled in the distant versus near future. But importantly, we further find that as people actually move from the distant to the near future, the waiting experience increases their patience when choosing between two rewards, hence improving their self-control. Although the tempting option is closer in time after a waiting period, the experience of waiting will make the individuals more able to resist by continuing to wait.

We note that in our studies, we explored the effect of a waiting period when the strength of a need was relatively stable and the cost of the wait did not change much over time. This situation is common—for example, when waiting for a new product or to upgrade to a newer model. In such situations, waiting does not increase the need but it increases patience, and future research would need to determine the function of that increase (e.g., whether it is monotonic). But certain needs do increase over time, and then the cost of the wait is not constant. For example, individuals waiting to quench their thirst will become thirstier over time, or those who seek medical help might feel an increasing discomfort, such that the objective cost of the wait increases. The effect of such increasing cost of waiting might then counteract the effect of the wait on evaluation of options and diminish patience, such that overall, people are no more likely to opt for the larger-later option after waiting.

Alternative explanations

We attributed the effect waiting to choose has on patience to the increase in the valuation of the options. However, having to wait possibly produces other effects, which can potentially influence patience. For example, people can represent waiting as a sunk cost (Arkes & Blumer, 1985) and therefore become more patient. Our interpretation is consistent with a sunk-cost effect to the extent that the efforts involved in waiting "sink" into increased valuation of the options. However, research on the sunk-cost effect also finds that after initial investment, individuals are more likely to continue the present course of action; for example, after waiting, they will choose to continue waiting (Navarro & Fantino, 2009). We do not find a general tendency to prolong the wait. Only when individuals chose between larger-later and smaller-sooner options did we see an increase in willingness to prolong the wait. In contrast, after waiting, individuals were less likely to continue waiting when they could expedite the delivery of a single product (Study 3).

Another alternative explanation is that waiting participants used a different reference point (e.g., Loewenstein, 1988) than non-waiting participants to estimate the time period between the larger-later and smaller-sooner options. That is, for waiting participants, the time between the larger-later and smaller-sooner options could have seemed subjectively shorter. For example, in the context of waiting 27 days (in Study 1), the difference between three and 23 days may seem less significant than if one had not waited. To address this concern, we measured perceived length of wait in the follow-up to Study 2. We found directional effects of waiting periods on participants' perceived length of the time intervals, which did not predict choices. Thus a reference-point alternative does not seem to be the deciding force for the waiting effect we found.

To summarize, although a waiting experience has multiple potential outcomes, the present investigation provides evidence consistent with the notion that waiting increases patience by increasing the perceived valuation of the options among those incurring the wait.

Conclusions and implications

We find that waiting to choose increases patience when a person chooses between larger-later and smaller-sooner options because after waiting to make a choice, people value the choice options more. Indeed, whereas waiting increases patience in choice among rewards that differ in value and spread out over time, a waiting period decreases patience when one considers paying a premium to expedite delivery of a single option.

Our findings have several important implications. First, individuals and society hold self-control in high regard (Baumeister, Vohs, & Tice, 2007; Kirby & Guastello, 2001; Mischel et al., 1989). We find that policy makers, managers, educators, and marketers can influence self-control by incorporating real or perceived waiting periods into choice. For example, managers can construe the waiting period as longer, beginning when a person first hears about the options, or shorter, beginning when the person visits the store. In turn, such construals will affect people's willingness to continue to wait for a better product.

Second, these findings fit into previous work suggesting choice structure systematically affects preference (Bown, Read, & Summers, 2003; Fishbach & Zhang, 2008; Hsee, 1996). We find that in the context of intertemporal choice, people appear more patient if they wait to choose between two options that spread out over time, but they appear more impatient if they wait to choose between delivering a single product sooner or later. Because waiting increases the value of the product relative to the value of time or money, emphasizing the waiting period can systematically affect the content of choice. On the basis of these results, we believe a waiting period is one variable that policy makers (e.g., "choice architects;" Thaler & Sunstein, 2008) should take into account when designing a choice set to better reflect self-control and satisfy people's preference.

Acknowledgement

This research is partially supported by a Grant (CUHK 443710) from the Research Grants Council, Hong Kong. Thanks go to Shelley Yang for her help in data collection. Appreciation is also extended to members of Fishbach Lab at the University Of Chicago Booth School Of Business and members of Consumer Cognition Workshop at the Chinese University of Hong Kong for invaluable comments.

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