The Effect of Default Time Units on Budget Estimation

Bora Min, University of Southern California
Gulden Ulkumen, University of Southern California

Whether budgets are elicited in one’s default time unit (the time unit one typically uses for budget planning) or a non-default unit influences the estimation difficulty and magnitude of budget estimates. Using non-default units can increase or decrease estimated budgets, depending on how consumers interpret and respond to metacognitive difficulty.

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How Extraneous Time Frames Bias Consumer Judgment and Choice

Chair: Anastasiya Pocheptsova, University of Maryland, USA
Meng Zhu, John Hopkins University, USA

Paper #1: Too Attractive to Pass: A Peculiar Appeal of Shorter Redemption Windows of Daily Deals
Yogesh Joshi, University of Maryland, USA
Anastasiya Pocheptsova, University of Maryland, USA

Paper #2: The Urgency Bias
Meng Zhu, Johns Hopkins University, USA
Yang Yang, Carnegie Mellon University, USA
Christopher Hsee, University of Chicago, USA

Indranil Goswami, University of Chicago, USA
Oleg Urminsky, University of Chicago, USA

Paper #4: The Effect of Default Time Units on Budget Estimation
Bora Min, University of Southern California, USA
Gülşen Ülkümen, University of Southern California, USA

SESSION DESCRIPTION
Consumers are frequently uncertain about the value of product offerings and features of tasks at hand (Bettman, Luce and Payne 1998; Slovic 1995) and they often make inferences and construct meanings based on information available in the local decision context (Ariely, Loewenstein and Prelec 2003; Kardes, Posavac and Cronley 2004; Kamenica 2008; Leszczyc, Pracejus and Shen 2007; Prelec, Wernfelft and Zettelmeyer 1997). An omnipresent feature of consumer decision context is time. From units of measurement to time limits, reference to time is a salient feature in the decision context, yet it is often arbitrary and not informative to the decision itself.

This symposium takes a close look at the relationship between references to time in the decision context, inferences constructed from them and their effects on consumers’ judgment and choice. Across four papers we find that consumers over-interpret and overweight time frames when making decisions, which biases their judgments in systematic manners. The papers document these effects using time references that range from potentially useful (coupon redemption times) to completely irrelevant (explicitly randomly assigned time limits) and across several important consumer judgments (such as budget estimates and purchase decisions).

First, Joshi and Pocheptsova show that consumers deviate from an optimal preference for deals with longer redemption windows in favor of deals that expire sooner for hedonic and highly desired products. They provide evidence that such effect is driven by perceptions of scarcity and need to justify the purchase. Zhu, Yang and Hsee continue to explore the connection between time reference and scarcity and demonstrate that consumers exhibit “urgency bias”, preferring to work on tasks with shorter (vs. longer) completion window but involving smaller (vs. bigger) payoff. They find support for an attention-based account and rule out task difficulty and outcome scarcity as alternatives. Next, Goswami and Urminsky suggest that incidental time limits affect people’s beliefs about tasks, such that longer time limits lead to higher estimates of the scope of the task. This leads to shifts in preferences between fixed versus variable time frames for task completion when available time is salient in the decision environment. Finally, expanding our understanding of the connection between time reference and perceptions of difficulty, Min and Ülkümen examine whether budgets elicited in one’s typically used time unit vs. in a non-default unit influences the estimation difficulty and magnitude of budget estimates. They find that using non-default units can increase or decrease estimated budgets, depending on how consumers interpret and respond to feelings of metacognitive difficulty.

Taken together, the four papers (all in advanced stages) elucidate the nuanced relationship between time references in the decision context and consumer judgment and choice, noting when and why time references may lead to suboptimal decisions or fruitless behaviors. As the session integrates diverse research to highlight newest theoretical developments in this important yet understudied area, it is expected to appeal to a broad audience, including those interested in time perception, inference making, judgment and decision biases, planning and budgeting, and consumer preference and choice.

Too Attractive to Pass: A Peculiar Appeal of Shorter Redemption Windows of Daily Deals

EXTENDED ABSTRACT
Daily deals, such as Groupon and Living Social, have fast become a popular sensation among consumers, with both websites boasting millions of users and billions in revenues. For example, Groupon (2013) reported and active customer base of 44.9 million; and a revenue increase of 31% North America alone. Such websites typically offer a few local “daily deals” for products or services that can be purchased at a substantial discount (40-60%). For example, consumers may buy a parking pass for $12 instead of $24, or a massage for $49 instead of $115. Interestingly, such deals come with different redemption windows, ranging from as short as 30 days to as long as one year. Longer redemption windows provide clear benefits to consumers by allowing them more flexibility regarding when to use their deal and increasing opportunities for consumption. A priori, one might expect that consumers would anticipate some uncertainty regarding when they would have an occasion to redeem a particular deal, preferring deals with a longer (vs. shorter) redemption window. On the contrary, in a series of studies including both experimental data and data on deals from the LivingSocial website, we identify conditions under which consumers are more likely to purchase deals that have shorter rather than longer redemption windows.

We argue that consumers interpret shorter redemption windows as a signal that the deal is more scarce (see also Innman, Peter & Rahgubir 1997 for a similar notion of the relationship between coupon availability time frame and perceptions of scarcity). Further, consistent with the findings that buying hedonic (vs. utilitarian) goods require more justification (Khan and Dhar 2010; Kivetz and Simonson 2002b; Kivetz and Zheng 2006; Okada 2005), we show that consumers use short redemption windows to justify the purchase of hedonic deals. Specifically, while consumers express preference for longer redemption windows for deals for utilitarian goods or services, the opposite holds for deals involving hedonic goods and services.

To test this proposition, in Study 1 (N = 136) we offered students an opportunity to participate (using their own money) in daily deals offered by a campus website. The participants were assigned to one of the cells in a 2 (redemption window: 1 month vs. 3 months) x 2 (deal: hedonic service vs. utilitarian service) design. As predicted, we find an interaction between the two manipulated factors (F(132) = 3.56, p = .06). Specifically, participants were more likely to purchase a deal for hedonic service when it was offered with a one month vs. three months redemption window (Mshort
Next, we test a potential moderator of our effect—the desirability of the product. We reasoned that highly attractive hedonic products should elicit higher level of guilt and therefore would require higher level of justification before making a purchase. The products in Studies 1&2 were all highly attractive and therefore we were not able to test this hypothesis. In study 3, we analyzed purchase data of 2349 deals on Living Social (by supplementing a dataset of deals data from Byers, Mitzenmacher & Zervas 2012 with information on the redemption window for each deal). The data included the redemption window, the time that the deal was available, the level of discount and, importantly, the number of “likes” given to the product on Facebook. We used the number of likes (which ranged from 0 to 880) as proxy for desirability of the product. Two coders, blind to the hypotheses, coded the deals into hedonic vs. utilitarian category. Controlling for the factors described above, there was a significant three-way interaction between the number of “likes”, the redemption window and the hedonic vs. utilitarian nature of the deal ($b = -1.27, t (2348) = 8.46, p < .001$). As expected, a follow-up spotlight analysis revealed that for hedonic products consumers were more likely to buy deals for highly desirable products when the redemption window was short vs. long ($M_{\text{short}} = 1214.5$ vs. $M_{\text{long}} = 798.8, t (1657) = 9.61, p < .001$), but the reverse was true for less desirable products ($M_{\text{short}} = 251$ vs. $M_{\text{long}} = 453.7, t (1657) = 5.50, p < .001$). In contrast, for utilitarian products consumers were more likely to buy deals with longer redemption windows, even for highly liked products ($M_{\text{short}} = 1286$ vs. $M_{\text{long}} = 1074, t (678) = 4.56, p < .001$).

In Study 4 ($N = 80$), we focused on underlying process by (a) measuring perceptions of scarcity as a function of short vs. long redemption windows and (b) by asking half of participants to justify their preference for the deal. All participants were asked to evaluate a deal from their highly preferred retailer (hedonic or utilitarian, manipulated between subjects). A three-way interaction between justification, nature of the deal and redemption window on ratings of scarcity emerged ($F(72) = 8.63, p < .01$). While redemption window had no effect on perceptions of scarcity for utilitarian deals ($F s < 1$), participants judged deals with shorter (vs. longer) redemption windows to be more scarce ($M_{\text{short}} = 5.33$ vs. $M_{\text{long}} = 4.33, F(72) = 6.3, p = .014$). Further, this effect was even more pronounced under justification ($M_{\text{short}} = 5.83$ vs. $M_{\text{long}} = 3.64, F(72) = 11.87, p < .001$).

Across several studies, we find that consumers deviate from an optimal preference for deals with longer redemption window in favor of deals that expire sooner for hedonic and, ironically, highly desired products. We provide initial evidence that such effect is driven by perceptions of scarcity and need to justify the purchase. Our findings provide an interesting insight into how time frames can bias consumer behavior in the daily deals market.

**The Urgency Bias**

**Extended Abstract**

Some tasks that we face are urgent and require immediate attention and others are important and involve great significance. When faced with multiple tasks of varying urgency and importance, how do we decide which task to perform? People may prefer working on urgent rather than important tasks, because important tasks are often more difficult, or because important tasks are often further away from goal completion (Kivetz, Urminsky, and Zheng 2006). Additionally, the missed outcome or opportunity for an urgent task may be perceived as more scarce and valuable (Brock 1968; Cialdini 2009). Finally, urgent tasks are often dependent of each other—missing one urgent task may result in series of losses in the future.

We propose that consumers will prefer working on urgent tasks over importance tasks, even when task difficulty, goal gradient, outcome scarcity and task interdependence are held constant. We term this tendency to prefer urgency over importance as “urgency bias”. Specifically, we define urgency (importance) as the state that requires immediate attention (involves great significance). Urgent tasks are characterized by short vs. long completion windows, and important tasks are characterized by big vs. small outcome magnitude. Urgency bias predicts that people are more likely to perform urgent tasks of less importance, rather than more important tasks of less urgency. Further, we propose an attention-based account to explain the urgency bias. That is, while deciding which tasks to work on, people pay more attention to urgent tasks with short completion window, instead of important tasks involving bigger outcomes.

Study 1 is designed to test the proposed main effect employing a simplified game. Participants saw one big ball and some small balls on the computer screen, and they could earn points by clicking on the balls. Relatively speaking, clicking on the small (big) balls is an urgent/not important task (important/not urgent) in the game. Specifically, participants were given one chance to click every other second throughout the 1-minute online game. Each click on the big (small) ball gave them 8 points (6 points). In the urgency condition, participants were told that they could click the big ball to earn points at any time, but they could only click a small ball to earn points when the small ball was active (i.e., when there was a counting down number 5, 4, 3, 2, or 1, on it). In the control condition, the game was identical except that both the big and small balls were active throughout the game. All participants were told that their task was to earn as many points as possible and they would be paid 1 cent for every 5 points earned at the end of the game. We calculated cumulative probabilities of clicking the big ball every other second. A 2(Condition) x 25(the cumulative probability in each period) mixed ANOVA revealed a significant interaction, suggesting that participants in the urgent condition were less likely to click the big ball than those in the control condition, and that the likelihood of clicking the big ball increased faster over time in the urgent condition than in the control condition. These results provide an initial demonstration of urgency bias. In Study 2, we replicated these findings using a different game in which (1) we used probability rather than a countdown window to produce urgency; and (2) not working on the important task results in a bigger loss, rather than working on the important task leading to bigger gain.

Study 3 generalizes the findings from simplified games to a real-life consequential choice context. Specifically, 119 Mturkers signed up for this study for a fixed payment of 50 cents. They were told that they could choose one of two tasks to take, Task A or Task B. They were told that in both tasks they would be given 3 minutes to type as many as possible out of 100 randomly generated 6-letter strings in the reversed order. All participants were told that they would earn a bonus that would be added to their mturk account by completing either of the tasks, and the level of bonus for each task would be randomly determined by a randomizer. All participants were assigned to earn a bonus of 12 cents by completing Task A, or a bonus of 16 cents by completing Task B. In the urgency condition, participants were further told that the two tasks also differed in their availability which would be randomly determined. They were then shown...
a dynamic randomizer which always told them that Task A would expire in 5 minutes, and Task B would expire in 50 minutes. In the control condition, participants were told that both tasks would expire in 50 minutes instead. As predicted, participants were significantly more likely to choose Task A (the low-payoff option) in the urgency condition than in the control condition (36.4% vs. 11.9%, \( p = .002 \)).

To test the proposed attention-based account, employing the same game as in Study 1, Study 4 asked participants to indicate at the end of the game whether they thought more about the small balls or the big ball when playing the game. The indirect effect differs from zero at the 95% CI: [-29, -14], indicating that attention mediates the effect of urgency manipulation on the likelihood to click the big ball.

Finally, employing the same task as in Study 3, Study 5 manipulated participants' attentional focus by showing them a reminder (which reads as “Note: If you choose Task A, you will lose the opportunity to earn 16 cents. If you choose Task B, you will lose the opportunity to earn 12 cents”) or not, in addition to manipulating urgency. Replicating previous findings, when no reminder was shown, participants were more likely to choose Task A (the low-payoff option) in the urgency condition than in the control condition (48.5% vs. 19.9%, \( p < .001 \)). However, when the reminder was shown, no difference in choice share was found.

In sum, we find that people exhibit the urgency bias, preferring urgency over importance.

**More Time, More Work: How (Incidental) Time Limits Bias Estimates of Project Time and Scope**

**EXTENDED ABSTRACT**

People have been shown to consume more time to do a specific job when more time is available to them (e.g., “Parkinson’s Law” 1955; Bryan and Locke 1966). The increased effort can lead to better objective performance in the presence of both self-imposed as well as externally-imposed deadlines (Ariely and Wertenbroch, 2002). In this research, we investigate people’s beliefs about others’ performance on tasks, depending on the task time limit. Across five completed studies, we find evidence that such beliefs are consistent with a general scope perception account wherein longer time limits are naïvely associated with a larger scope of work.

In Study 1, judges read about an actual pretest in which all workers solved a 67 piece jigsaw puzzle in an untimed condition and took 31 minutes or less. Jigsaw puzzles were chosen for this controlled experiment because it is easy to quantify the amount of work, and assuming there is only one way to ‘solve’ it correctly, quality of work is not relevant. In an incentive-compatible setting, judges estimated how long it would take the average worker in a new experiment assigned randomly (using a coin toss) to different timed conditions (35 minutes vs. 60 minutes) to solve the jigsaw puzzle. Between subjects, the estimated average time in the long (60 minutes) vs. short (35 minutes) time limit conditions was 34 vs. 26 minutes (\( p < .001 \)), compared to 29 minutes in the control (unlimited time) condition. The results could not be explained by incidental anchors, informational or quality inferences, or intrinsic motivation.

In Study 2, judges were given the same background information and one of three time limits (30 mins, 45 mins, unlimited time control), but were told that the workers themselves would not know about the time limits as they worked on the puzzles. Again, judges estimated more time in the longer time limit condition (31 vs. 28 minutes, \( p < .05 \)). These findings cannot be explained by the judges’ anticipating the effects of time limits on workers and accurately applying Parkinson’s Law.

In contrast, we propose that longer time limits are simply associated with “larger” tasks, and therefore people will estimate not only longer completion times, but also larger scope of the task. In the next two studies, judges were asked to estimate the number of pieces in the puzzle (as a proxy for the scope of work) and were provided with the average time (Study 3) or an exact distribution of times (Study 4) taken to solve the puzzle under untimed conditions. Judges estimated more puzzle pieces in the 45 minutes condition than in the 30 minutes condition (Means: 177 vs. 131, \( p < .05 \); 122 vs. 103, \( p < .10 \) respectively).

Lastly, in an incentive-compatible game judges budgeted for a task to be conducted by a sub-contractor who would be paid based on time spent and did not know about time limits. Judges allocated significantly more money for the task ($6.09 vs. $5.26, \( p < .05 \)) when more time was available to complete it, despite having the same distribution from which the actual time would be drawn, which impacted their own earnings.

The studies suggest that people overgeneralize rules about the relationship between time limits and work, which they have learned in relevant contexts and over-apply them, resulting in systematically biased decisions. The perceived association between scope of work and time can result in suboptimal choices by an economic agent responsible for sub-contracting tasks with pre-decided time limits which are exogenously determined. This can lead to shifts in preferences for a fixed rate contract versus a variable rate contracts when available time is salient in the decision environment, and therefore can have serious financial implications.

**The Effect of Default Time Units on Budget Estimation**

**EXTENDED ABSTRACT**

Consumers are often called upon by financial institutions or advisors to estimate budgets over different recurring time intervals. For instance, a consumer who normally uses a week frame to plan her activities may be asked to provide a budget estimate in a week frame (default unit), or a month frame (non-default unit). While it is well established that judgments and decisions can be influenced by the unit in which quantitative information is expressed (e.g., Ülkümen & Thomas, 2013; Zhang & Schwarz, 2012), the specific notion of default units has received sparse attention (Lembregts & Pandelaere, 2013). In this project, we investigate the effect of default units on consumers’ spending estimates.

We expect that estimating budgets using a non-default (versus default) unit will lead to lower budget estimates, for two reasons. First, in line with previous findings suggesting that lack of familiarity with a unit can increase estimation difficulty (e.g., Block, Hancock & Zakay, 2010), we expect non-default (versus default) units to increase the perceived difficulty of budget estimation. This is because providing budget estimates in a non-default (versus default) unit should make it more difficult for consumers to unpack the relevant expenses contributing to their total budget. Consequently, such inadequate unpacking of future expenses should bias estimates downward, leading to smaller budgets (Fiedler, 2007).

Second, using non-default (versus default) units may also influence the perceived importance of budget estimation. Specifically, we hypothesize that consumers would consider the task of estimating their budget to be less important when the estimation is done in non-default (versus default) units. Since perceived importance of a task determines the amount of effort invested (Eklöf & Nyroos, 2013), we expect non-default (versus default) units to result in less elaborate, and ultimately smaller budgets.
While we always expect smaller budgets, the process should depend on whether consumers prioritize difficulty or importance considerations. If this is the case, then we would expect construal level to determine which of the aforementioned two processes mediates the effect of default units on budget estimation. Cheema and Patrick (2008) demonstrated that the perception and interpretation of stimuli depends on construal level. Research on goals (Ülkümen & Cheema, 2011) found that goal difficulty becomes salient in low-level construal, whereas goal importance becomes salient in high-level construal. In line with this, we predict that for low-level (high-level) construers, estimation difficulty (estimation importance) would mediate the effect of non-default units, leading to smaller budget estimates.

Study 1. We asked 202 participants to estimate their total budget in a randomly assigned unit: week or month. To assess their personal default unit for budget planning, we asked them to indicate which time frame they usually use to plan their budget: weekly, monthly, or other. We categorized participants into the default (non-default) unit condition if the experimentally assigned unit was consistent (inconsistent) with their personal default unit. We converted estimated budgets into a comparable, monthly basis, log-transformed, and submitted them to a 2 (Estimation unit: default, non-default) x 2 (Personal unit: week, month) ANOVA. Participants using a non-default unit provided smaller budget estimates ($M = 954.4$) than those using their default unit ($M = 1,156$), $F(1, 188) = 4.38, p < .05, \eta^2_p = .02$, regardless of whether their personal preference was to budget for a week or a month ($F = .87, p > .1$).

Study 2. To replicate the finding and explore initial evidence of estimation difficulty engendered by non-default units, we recruited 198 participants to complete a task identical to Study 1, and also included three items to assess the difficulty, confidence, and certainty they experienced while estimating their budgets ($\alpha = .87$). Replicating Study 1, participants using non-default units estimated smaller budgets ($M = 1,048$) than those using default units ($M = 1,411$), $F(1, 178) = 3.10, p = .08, \eta^2_p = .02$, regardless of the preferred unit ($F = .68, p > .1$). Moreover, participants who used non-default (versus default) units experienced greater cognitive difficulty ($M_{\text{non-default}} = 3.41$ vs. $M_{\text{default}} = 3.02$), $t = 1.83, p < .01, d = 0.27$.

Study 3. To test our underlying processes, we recruited 230 participants and manipulated construal level using a thought exercise (adapted from Freitas, Gollwitzer & Trope, 2004) where half of them in the high (low) construal level thought about why (how) they maintain and improve their physical health. Then, they made budget estimates. If this is the case, then we would expect construal level to determine which of the aforementioned two processes mediates the effect of default units on budget estimation. We converted estimated budgets into a comparable, monthly basis, log-transformed, and submitted them to a 2 (Estimation unit: default, non-default) x 2 (Personal unit: week, month) ANOVA. Participants using a non-default unit provided smaller budget estimates ($M = 954.4$) than those using their default unit ($M = 1,156$), $F(1, 188) = 4.38, p < .05, \eta^2_p = .02$, regardless of whether their personal preference was to budget for a week or a month ($F = .87, p > .1$).

As well as replicating the main findings ($M_{\text{default}} = 1,240$ vs. $M_{\text{default}} = 1,480$), we found (marginally) significant moderated mediation effects for both estimation difficulty ($\beta = -1.049, p = .023$) and estimation importance ($\beta = -.52, p = .09$). For low-level construers, the effect was mediated by estimation importance (LLCI = .0086, ULCI = .3546), whereas for high-level construers, the effect was mediated by estimation importance (LLCI = -.4980, ULCI = .0218).

Three studies demonstrate whether budgets are estimated in one’s default or non-default time unit influences the experienced difficulty (importance) of budget estimation, which in turn biases these estimates downward for participants in low (high) construal level. These findings help reconcile seemingly conflicting prior findings regarding the direction in which metacognitive feelings influence judgments (Fiedler, 2007; Ülkümen & Thomas, 2013). We demonstrate that estimation difficulty and importance do not influence budgets in a straightforward manner. The direction in which perceived difficulty and importance influence estimated budgets depends on the source of these metacognitions, as well as consumers’ interpretation of them.

Our research is the first exploration of default units at the individual level and in the context of budgeting. In continuing research, we examine how estimation units can be used to improve accuracy of budget estimation.

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