

Decision Processes Colloquium

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Looking Ahead: Duration Markers and Their Effects on Choice

In this paper, we study a consumer who needs to accomplish a certain task that is due D days from now. Does the motivation to start working on that task change if the D -day duration ends in the same period (say, the same month or year) as the present, or in the next period? We hypothesize that duration markers – salient events that consumers use to mark the passage of time –categorize future durations into two periods. In a series of studies, we show that, holding the actual duration between the present and a deadline constant, consumers are more likely to initiate a task (e.g., open a bank account and start working on a consulting project), more impatient towards a future consumption, and more committed to a planned activity, when the target event occurs before (vs. beyond) a salient duration marker. Further, we directly tested whether these effects are driven by a motivational mechanism (i.e., events that occur before marker put people into an implemental mindset), or a cognitive one (i.e., events that occur before marker seem closer), and found evidence for the mindset explanation.

PAPER ATTACHED: The Effect of Duration Markers on the Decision to Commence a Task (Yanping Tu & Dilip Soman)

The Effect of Duration Markers on the Decision to Commence a Task

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The Effect of Duration Markers on the Decision to Commence a Task

ABSTRACT

In this paper, we study a consumer who needs to accomplish a certain task that is due D days from now. Does the motivation to start working on that task change if the D -day duration ends in the same period (say, the same month or year) as the present, or in the next period? We hypothesize that duration markers – salient events that consumers use to mark the passage of time – categorize future durations into two periods. In a series of studies, we show that, holding the actual duration between the present and a deadline constant, consumers are more likely to initiate a task (i.e., open a bank account and start working on a consulting project in Study 1, and prepare for a trip in Study 2), more impatient towards a future consumption (Study 4), and more committed to a planned activity (Study 5), when the target event occurs before (vs. beyond) a salient duration marker. Further, we directly tested whether these effects are driven by a motivational mechanism (i.e., events that occur before marker put people into an implemental mindset), or a cognitive one (i.e., events that occur before marker seem closer), and found evidence for the mindset explanation.

“February twenty fourth looked a lot closer from this side of Christmas”

- Rowling, J.K, *The Goblet of Fire*

Much of our lifetime is devoted to getting things done. Whether it be getting a paper ready for submission to this journal, working on a consulting project, packing for a vacation trip, saving for a new home, shopping for food and supplies for the holiday party, helping our kids prepare for their next hockey tournament, or preparing for the TriWizard Cup (like Harry Potter in the opening quote), consumers often need to plan activities with the goal of getting them done by some deadlines the future. Imagine, in particular, that a consumer has to organize a dinner in ten days and needs to shop and cook for this event. When will she start doing these activities?

While the exact response to that question will depend on what other activities this consumer is engaged in, it is intuitive to believe that the likelihood of initiating these activities will gradually increase as the duration to the deadline gets shorter. Indeed, research in economics (Becker 1965), intertemporal choice (Ainslie and Haslam 1992) and psychology and marketing (Kellaris and Kent 1992; LeClerc, Schmitt, and Dube 1995) has conceptualized time as a linear construct. In this paper, we argue that consumers also use a categorical representation of time in planning tasks, and that the propensity to start activities depends on whether the tasks are due in the same category of time as the present (the present period) or in a different one (the future period). As a specific example, we would predict that the likelihood of our consumer starting preparations for her dinner in ten days would be greater if that dinner were scheduled for the same month as the present than if it were for another month. Similarly, Harry Potter felt a greater sense of urgency in preparing for the TriWizard Cup after Christmas than he did before.

The fact that people might take a categorical approach to encode time is consistent with the notion that people tend to categorize periods routinely, typically for the purposes of tracking, documenting and planning activity. For instance, we naturally partition time into years, months and days, with each period having a functional significance for some aspects of planning. For instance, most consumers (and corporations) plan expenses by the month, work activities by the day and set goals for the year. In addition, there are many other markers of time – salient events that consumers use to keep track of time (Ahn, Liu and Soman 2009; Zauberger et al. 2010) that people often use in an ongoing manner - students tend to compartmentalize their time by terms, farmers by harvesting seasons, etc.. We propose that these “markers” result in a categorization process (Tversky 1986), whereby events that are to happen before the next marker loom larger than events that are to happen right after the marker. We further propose that consumers who might be in a deliberative mindset prior to the occurrence of the marker would shift to an implemental one afterwards (Xu and Wyer 2007), and this drives their tendency to act when the target event is in the same period as the present. Consumers are consequently more likely to start expending efforts on a task that (holding actual duration constant) will occur before a marker, than for one that will happen after a marker.

The rest of this paper is organized in three sections. First, we review relevant literature, develop a theoretical framework and propose testable hypothesis. Next, we present the results of several field and laboratory experiments to test our framework. Finally, we conclude with a general discussion and potential avenues for future research.

CONCEPTUAL FRAMEWORK

The present research addresses a very specific problem. Consider a consumer who needs to accomplish a certain task in a given duration, D days. There is no intermediate deadline or deliverable, and the final task is due at the end of D days. When does the consumer get started on the task and what is their motivation to work towards the deadline? In our research, we consider salient duration markers that might serve to mark the passage of time into two categories, the present period and a future period. Does the motivation to start working change if the D -day duration ends in the same period as the present, or in the next period?

In order to address this specific research problem, we draw on two streams of literature that offer pertinent insights: the literature on the psychology of time and the literature on mindsets as it relates to task accomplishment.

The Psychology of Time

Much of the research studying how people estimate time durations has been done with retrospective events (e.g., Huttenlocher, Hedges, and Prohaska 1988). One popular model for the memory of experiences was the time tagging model (Yntema and Trask 1963) which effectively suggests that salient events in the past are marked with a date-stamp. A second popular model was the conveyer belt model, which effectively suggests that events are stored in memory in the order in which they occurred, and the time duration between events is also stored (Murdock 1974; see also Huttenlocher, Hedges, and Bradburn 1990).

However, the fact that individuals do not have the ability to accurately monitor the passage of objective time is now a well-known finding in the literature (e.g., Block 1990; Glicksohn 2001; Treisman 1984). There are two key themes in this literature. First, the work explicitly or implicitly

implies the existence of an internal timer to mark the passage of time (Glicksohn 2001; Stroud 1967; Treisman 1984). In essence, the human body has an internal timing mechanism, but this mechanism doesn't correspond to actual objective time durations. This internal clock is affected by physiological factors like arousal and pulse rates. Second, duration judgment is flexible and inaccurate as compared to objective time, and influenced by multiple factors like emotions (Droit-Volet and Meck 2007), arousal (Gruber and Block 2003; Kellaris and Mantel 1996), mental engagement (Chaston and Kingstone 2004), motivation (Conti 2001), novelty and variety of activities (Ahn, Liu, and Soman 2009), among others (see Block 1990 for review). Besides, time seems to move faster when the consumer is distracted from the wait, and hence the simple prescription from past research is to use newsboards, TV screens and other means of distraction (Kellaris and Kent 1992).

A corollary of the idea that people cannot estimate objective time accurately is the notion that people might not encode time linearly. In particular, Zauberma n et al. (2009) conducted a series of studies to show that consumers' subjective perceptions of prospective durations do not map onto objective durations. In fact, this mapping function is concave such that the sensitivity to large durations of time declines as they get further into the future. In a similar vein, Kim and Zauberma n (2009) showed that when consumers look ahead to future durations of time, they show diminishing sensitivity to longer time durations and time contraction.

A related set of studies examines the effects of so-called markers in the estimation of retrospective durations (Ahn, Liu, and Soman 2009; Zauberma n et al. 2010). In their conceptualization of memory markers, Ahn, Liu, and Soman (2009) referred to markers as accessible snapshots (or bits of information) that capture the salient moments in a changing environment during the course of an experience. Likewise, Zauberma n et al. (2010)

conceptualized event markers as accessible and memorable events from the past. Note that the accounts are similar in principle to the time tagging model of Yntema and Trask (1963); however do not assume the knowledge of the actual date of past events in estimating durations. While memory markers differ from event markers in that they are generated and encoded by the individual rather than being external “world events,” they both serve as cues to the estimate of duration. In both models, events interspersed with a larger number of markers are judged to have a longer duration than events with fewer markers.

In the present research, we use the term “markers” to represent moments of time used by consumers to mentally account for time. Most consumers use elements of the calendar – days, weeks, months and years – to mark time. Some subgroups of consumers use other markers that may be unique to their profession. For instance, students may mentally account for time using semesters; farmers using the harvest season and accountants using the end of fiscal quarters. Based on the earlier research on memory markers and applying it to prospective durations, it is likely that a duration of time – or the end of the duration - is seen as longer (further away) if it spans a duration marker. In particular, a consumer might believe that she has a longer duration of time to prepare for a dinner that is due in ten days if the ten-day window ends in the next month than if it ends in the current month. Consequently, the consumer might be more likely to want to delay working on the task in the former condition.

Categorization and Mindsets

Prior research has indicated that people tend to naturally categorize objects and events (Barsalou, Huttenlocher, and Lamberts 1998). The categorization process is driven by salient

properties of the environment (Tversky 1992). In the domain of time, in particular, the presence of a duration marker can result in the categorization of prospective time into “before marker” and “after marker” categories (for example, events that happen this month versus those that will happen next month). And in the domain of geography, categorization can be achieved by considering towns and cities on one side of a state border versus on the other side of a state border (Mishra and Mishra 2010).

Note that this type of categorization is functional in some respects. Whether outcomes occur this month or next month can be indicative of how much a consumer might be willing or able to spend on them because most consumers get paid on the first day of a new month. Likewise, setting up a new business on one side of a state border can indeed be different from on the other side because there may be difference in the taxation systems across the two states. Yet, categorization can create biases in other domains where the membership to a category might not be diagnostic. Mishra and Mishra (2010) showed that individuals considered themselves to be more protected against an outbreak of a deadly virus if they were on the other side of a state border from the disaster, compared with when they were in the same state, although the objective spatial distance between consumers and the disaster place was held constant in both conditions. From a practical perspective, state borders do not present a real barrier for transmission of infectious diseases and hence membership of a state should not matter. In a similar vein, we propose that duration markers create categories of time that may be functional in some domains (e.g., household money management) but not in others. However, we believe that category membership does play a role in the perceived urgency of getting a task done. This urgency is generated by the fact that people tend to focus more on objects in the present category – the category that is currently activated – as oppose to objects in other categories (see LeClerc, Hsee,

and Nunes 2005). As one of our colleagues remarked when we presented this research, “If it’s something that is due next period, I’m vaguely aware of it but it’s filed away – somewhere on the back burner. If it’s due this period, it is front and center of my mindspace.” The relative urgency of the task if it occurs in this period versus in the next can be conceptualized by the different mindsets that are evoked.

Consumers often go through multiple stages while making decisions or accomplishing tasks (Gollwitzer 1999; Lee and Ariely 2006). In research on goal attainment, Gollwitzer and his colleagues (Gollwitzer 1999; Gollwitzer and Bayer 1999; Gollwitzer, Heckhausen, and Steller 1990) proposed that goal pursuance is characterized by two separate, sequential stages: an initial stage in which individuals are uncertain about their goals and seek to define a desired outcome, and a subsequent stage in which individuals have already established the goal they wish to pursue, and are considering when, where, and how to attain the goal. People tend to adopt a deliberative mindset characterized by open-mindedness and a more impartial analysis of goal-relevant information in the first stage, and an implemental mindset characterized by a more optimistic analysis of goal-relevant information and greater action orientation in the second stage. These different mindsets can be induced in different ways – through actual progression in a task, through instructions (Taylor and Gollwitzer 1995), and through priming people by having them evaluate versus choose options in an unrelated category (Xu and Wyer 2007, 2008). The specific mindset that people adopt also changes as a function of physical location (Lee and Ariely 2006) - for example, shoppers at a grocery store tended to adopt a more implemental mindset when they were inside the store rather than outside the store. We propose that the categorization of future durations into the “present period” versus “future period” can also trigger changes in mindset and decisions. Specifically, when events transition from a future

period to the present period, people are more likely to adopt an implemental mindset. Once the implemental mindset is activated, people become more committed to the goal they have decided to pursue and tend to have a more focused cognitive orientation (Gollwitzer 1999; Gollwitzer and Bayer 1999).

Applying both these streams of research to the consumer who needs to accomplish a certain task in D days, it is likely that the due date for this task might appear to be closer when it is before a salient [but functionally irrelevant] duration marker than when it is after. And when the due date is before the duration marker, the consumer will be in an implemental mindset. Both of these accounts lead us to formally hypothesize:

H1: Holding actual duration constant, consumers are more likely to want to commence work and are more motivated on a task for which the deadline is in the present period rather than in a future period; i.e., when the deadline falls before the duration marker.

As discussed earlier, two accounts might underlie this prediction. First, the duration marker could change perceived duration [the perceived duration account] because consumers perceive a deadline that is before (vs. beyond) a duration marker to be closer, they start doing it earlier. Second, the marker might serve to change mindsets [the mindset account] – consumers view an event that is before (vs. beyond) a duration marker with more of an implemental mindset, thus have stronger willingness to initiate it. Note that the perceived duration account is purely a cognitive account while the mindset account is a motivational account, and that we expect the mindset account to generate the same prediction on duration length perception as the cognitive account does under certain conditions.

Past research shows that perceived duration towards an event is shaped by the nature of and the way people construe the event. For example, emotionally intense (Van Boven et al. 2010) and positive (Haddock 2004; Ross and Wilson 2002) events feel closer than less intense and negative ones. More recently, Jiga-Boy, Clark, and Semin (2010) found that the more effortful a task, which has a specific deadline in the future, is, the closer it looms, and this holds even when people are semantically primed with “high effort” in a scrambled sentence task prior to judging the duration. Distorting temporal distance in such a way can be strategic and adaptive; effort serves as an action-related cue, thus perceiving an effortful task to be temporally proximate could prompt people to respond to challenges earlier. This piece of work echoes with the stream showing that perceptions of physical features are shaped by physiological or contextual factors that are related to action (e.g., Bhalla and Proffitt 1999; Durgin et al. 2009; Proffitt et al. 2003). Accordingly, we reason that a future task may appear closer in time when viewed with an implemental mindset to fit one’s action orientation.

Notably, consumers only need to implement their own tasks, rather than others’, therefore if indeed the mindset account is playing a role, we should expect duration markers to affect duration length perception only when consumers are estimating temporal distance for their own (vs. others’) future tasks. On the contrary, if the duration perception account is working, the effect of duration markers on duration length perception should hold regardless the actor of the task. Hence we offer the following pair of competing hypotheses:

H2a: If the effects in H1 are driven by the perceived duration account, the duration marker would have an effect on perceived duration irrespective of whether consumers are making judgments and decisions for themselves, or for other people.

H2b: If the effects in H1 are driven by the mindset account, the duration marker would have an effect on perceived duration only when consumers are making judgment and decisions for themselves, rather than for others.

Prior literature has shown that people with an implemental mindset not only have a greater propensity to act (Gollwitzer and Bayer 1999; Xu and Wyer 2007, 2008), but are also more committed to the task and impatient to get it accomplished. Thus, we hypothesize that:

H3: If the effects in H1 are driven by the mindset account, an event that occurs before a salient duration marker [relative to after the marker] would induce a greater task commitment and a greater impatience to get the task accomplished,

SUMMARY OF STUDIES

We conducted a series of five studies to test these hypotheses. In each study, our goal was simply to highlight one duration marker and show its effects on various relevant outcomes respectively (e.g., task initiation, duration perception, task commitment and impatience). In Study 1, we showed that farmers in India (in a real task) and MBA students in Canada (in an experimental task) were more likely to start saving towards a target or start working on a project respectively if the deadline was in the same year, or the same period as the present. In a post-test, we used multiple periods and found a sharp decrease (a discontinuity) in likelihood of commencing activity when the event was pushed just beyond the marker. In Study 2, experimental participants reported a greater likelihood of preparing for a trip that was before a marker than after. We also found results consistent with the predictions of both duration perception account and the implemental mindset account. In Study 3, we sought to directly pit

the cognitive explanation (i.e., the perceived duration account) against the motivational explanation (i.e., the mindset account) and found evidence supporting the latter one. In Studies 4 and 5, we found further evidence consistent with the mindset account. In Study 4, we showed that consumers were more impatient for a future consumption opportunity that were to occur before the marker, and in Study 5 we showed that because of the experienced urgency to get things done, consumers were also more committed to these events.

STUDY 1

In study 1, we aimed to establish the basic effect of duration markers that exist in real life on the tendency to initiate a task. We studied two duration markers in two separate contexts - the end of a year and its effect on Indian farmers' decision to open a bank account (study 1A), and an MBA formal dinner - a traditionally big event in the MBA community - and its effect on students' willingness to start working on a consulting project (study 1B).

Study 1A

This study was conducted in an agricultural community in rural India and was part of a larger project whose goal was to develop financial literacy and skills among small-holding farmers. All participants in this study had attended a financial literacy seminar in which they were told about a number of savings products. The experiment used a two condition (before-marker vs. after-marker) between-subject design. Two hundred and ninety-five male farmers (all with two children in the 4-8 years age range) participated in this field study.

Method

Each participant was approached individually by a member of the team that had initially provided the financial literacy training, and was presented with a specific savings product. The presentation of the product was made either in June or in July. Participants were reminded that one of the main goals for saving was to create a fund for educating their children. The savings product had a unique feature that it offered a match 20% of all contributions in the fund by a deadline. This match feature was available provided a) all paperwork was completed and b) at least Rs. 5000 had been accumulated in the fund within six months. Each farmer was explained these details, and was finally reminded “*You have to complete the paperwork and put at least Rs. 5000 in the account by December xx, 2010 [or January xx, 2011].*” - this sentence was also printed on a display board and shown to each farmer.

Each farmer was then told that if they so wished, they could open an account (with zero deposit) and complete the paperwork right now while the representative was present. Alternately, they could open the account at any point in time by going to the closest branch of the bank.

We used the end of the calendar year as a salient duration marker, thus people who had a deadline in December 2010 were in the before-marker condition, and those with a deadline in January 2011 were in the after-marker condition. We noted that the new calendar year did not mean much financially for these farmers. Most of their revenues accrued at the end of the monsoon season (October-November), and their financial profiles in January 2011 were not significantly different from those in December 2010.

Results and Discussion

Farmers in the before-marker condition were more likely to open the account immediately (30.82%; 49/159) than those in the after-marker condition (8.09%; 11/136), $\chi^2(1) = 23.37, p < .01$. Clearly, when the deadline for accumulating Rs. 5000 in their accounts was in 2010 rather than in 2011 (although each farmer had exactly six months from the date the offer was made), there seemed to be a greater sense of urgency in opening the accounts and getting the process started.

Data from this field study supported H1 and showed initial evidence that event that occurs before a salient duration maker is more likely to promote people to initiate it immediately.

Study 1B

This study used a 2 (event location: before-marker vs. after-marker) X 2 (time available: 10 days vs. 20 days) between-subject design. The second factor served as a conceptual replication. One hundred and thirty MBA students (39 females) from a North American university participated in this study

Method

This study was conducted during the first year of the MBA curriculum, during which participants were all very busy taking several required courses. We used the MBA formal dinner, a traditionally big event, as a topical duration marker.

Participants were told that “*You have an opportunity - over and above all the workload from classes - to do some freelance consulting work for [a company that many MBAs wanted to*

work for]". Those that said yes were further told that "*The client estimates that you need to spend about 20 hours on this project. The deadline for submitting the project is 10 days [20 days] from today. Would you like to start it now or later? (1 = definitely now, 9 = definitely later)*" Before participants responded, they were also reminded of the formal dinner and its details [date and location].

Participants were asked this question either 5 days or 25 days before the formal dinner (duration marker) and the time available for completing the project was either 10 days or 20 days. For each "time available" for completion condition, therefore, the deadline was before the marker in the 25-days-to-marker condition, and after the marker in the 5-days-to-marker condition.

Results and Discussion

The average willingness to start working on the project now is plotted in Figure 1 as a function of event location and time available. Note that smaller numbers indicate a greater willingness to start working now. A 2 (event location) X 2 (time available) ANOVA yielded a significant interaction effect, $F(1,126) = 7.13, p < .01$, as well as significant main effects of event location ($F(1,126) = 64.83, p < .01$) and time available ($F(1,126) = 4.71, p < .05$). In order to test H1, we wanted to compare the mean willingness to start working under each time available condition for the 25-days-to-marker condition (deadline before marker) with the 5-days-to-marker condition (deadline after marker). We therefore conducted two planned contrasts and found that a) for participants who had 10 days available, those in the before-marker condition were more willing to start now ($M = 2.55, SD = 1.35$) than those in the after-marker condition

($M = 5.69$, $SD = 1.92$), $t(63) = 7.44$, $p < .01$, and b) for participants who had a deadline 20 days away, again, those in the before-marker condition were more willing to start now ($M = 3.97$, $SD = 1.47$) than those in the after-marker condition ($M = 5.55$, $SD = 1.80$), $t(63) = 3.88$, $p < .01$.

These data lent further support to H1.

Insert figure 1 here

In both a field study setting and a hypothetical experiment setting, we found a greater tendency to commence action on a task if it were due before a salient marker. However, in both studies we used only two snapshots of time. If our argument about the marker serving as a basis for categorization and changing mindset is true, we should expect to see a greater willingness to start when the deadline is before the marker, and a sudden decline in willingness to start when the deadline moves just beyond the marker. In a follow-up experiment, we tested for this prediction using multiple time periods. One hundred undergraduate students (43 females) from a North American university participated in this study and were given the following scenario:

“Imagine that today is April 24th (vs. 25th vs. 26th vs. 27th), and you have to finish a 4-hour data entry job by 29th (vs. 30th vs. 1st May vs. 2nd May). Would you like to do it now or later? (1 = definitely now, 9 = definitely later)”

The end of the month as a duration marker was emphasized by spelling out the dates (the present date, and the due date) in a larger, colorful font. Participants who had a deadline on April 29th or 30th were in the before-marker condition, whereas those who had a deadline on 1st or 2nd

next month were in the after-marker condition. Figure 2 shows the mean willingness to start working on the project now as a function of the deadline.

Insert figure 2 here

A one-way ANOVA on people's willingness to initiate the task yielded a significant difference among conditions, $F(3, 96) = 16.88, p < .001$. Since people in the before-marker conditions didn't differ - "April 24th – April 29th" ($M = 3.60, SD = 1.73$) and "April 25th – April 30th" ($M = 3.84, SD = 1.80$), and those in the after-marker conditions didn't differ - "April 26th – May 1st" ($M = 6.12, SD = 1.56$) and "April 27th – May 2nd" ($M = 6.08, SD = 1.61$), we combined the former two conditions as before-marker condition and the latter two after-marker condition. An independent t-test showed that people in the before-marker condition were more likely to start now ($M = 3.72, SD = 1.75$) than those in the after-marker condition ($M = 6.10, SD = 1.57$), $t(98) = 7.16, p < .001$.

As Figure 2 and the analysis reported above show, we found that there was not much difference in the reported willingness to start working on the job in the two conditions, for which the deadline was before the month-end marker. Likewise, there was no difference in the two conditions, for which the deadline was after the month-end marker. However, there was a sudden discontinuity when the deadline just moved past the duration marker and the willingness to start working dropped significantly. This pattern of data indicated a categorizing approach people took in viewing a future deadline that stands on different sides of a duration marker.

Collectively, the studies reported thus far supported H1. However, the data did not speak to the antecedents of the observed effects. In particular, is the stronger willingness to initiate task in before-marker condition due to a shorter duration length perception, or an implemental mindset? Studies 2 and 3 were designed to investigate this.

STUDY 2

This study differed from Study 1 in a number of ways. Firstly, in addition to measuring the willingness to start working now, we also employed direct measures of duration length perception and mindset. Secondly, instead of using naturally occurring duration marker (like years and months), we primed marker semantically. Specifically, we informed participants that the target event would occur either after or before a certain date while keeping the actual date of the target event constant.

This study used a one-way (event location: before-marker vs. after-marker) between-subject design. Sixty MBA students (33 females) from a North American university participated in it.

Method

Participants responded to a packet of several unrelated studies, of which the present study was the first. Participants were asked to imagine themselves in the following scenario:

*Your employer has announced that **after 15th** [**before 25th**] of this month, they would fund a weekend trip to a warm beach resort as a reward for all employees.*

Just now you received an official email notification saying that the departure day is on the 20th.

Participants were given a few minutes to simulate the situation, after which we measured a) their tendency to initiate the event (*Will you start preparing for your beach tour now or later? 1 = definitely now, 9 = definitely later*), and b) perceived duration length (*How close do you feel the departure day is from now? 1 = extremely close, 9 = extremely far away*).

Further, we used a choice deferral paradigm adapted from Xu and Wyer (2007) to measure implemental mindset. Specifically, participants were told that they need to buy a bottle of insect repellent for the beach tour and were presented with two recommended options. We asked them whether they would like to buy one of them now, or decide later. For those who would like to buy now, we further asked them to specify which one they preferred. The theory here is that since an implemental mindset would push people to get things done – in this case, buying an insect repellent now, rather than deferring the choice (Xu and Wyer, 2007), a preference of “buying one now” could reflect a more implemental mindset.

At the end of the study, we also measured a) perceived attractiveness of this tour (*1 = not attractive at all, 9 = extremely attractive*), b) happiness due to this tour (*1 = just a little, 9 = extremely happy*), and c) past beach tour experience (*Have you been on a beach weekend vacation before? Yes vs. No*) as control variables. None of these measures were significantly different across experimental conditions, thus were moved from further analysis.

Results and Discussion

People in the before-marker condition were more likely to start preparing for the tour now ($M = 3.17$, $SD = 1.67$) and perceived the departure day to be closer ($M = 3.79$, $SD = 1.42$) than those in the after-marker condition ($M = 5.29$, $SD = .97$; $M = 5.48$, $SD = 1.65$, respectively), $t(58) = 6.05$, $p < .001$; $t(58) = 4.24$, $p < .001$, respectively. Besides, we found evidence for the implemental mindset account in the choice deferral task. Participants in the before-marker condition were more likely to buy the insect repellent now ($M = 68.97\%$; 20/29) than those in the after-marker condition ($M = 38.71\%$; 12/31), $\chi^2(1) = 5.51$, $p < .05$.

While the data from Study 2 further supported H1, it also generated results that were consistent both with the perceived duration account and the mindset account. We further explored the relation between the willingness to start preparing (i.e., *Will you start preparing for your beach tour now or later?*) and duration length perception (i.e., *How close do you feel the departure day is from now?*). Although these two variables correlated with each other neither in the whole sample nor in the after-marker condition, there was a positive correlation in the before-marker condition ($r = .44$, $p < .05$). Another way of expressing this result was that the duration marker influenced duration perception only when people were implementation-oriented, suggesting that duration perception was the consequence, rather than the cause of an implemental mindset. Study 3 was designed to further tease apart these two accounts for the observed effects.

STUDY 3

In the present study, we sought to directly pitting the perceived duration account (H2a) against the mindset account (H2b). The study used a 2 (actor: self vs. other) X 2 (event location: before-marker vs. after-marker) X 2 (event valence: positive vs. negative) between-subject

design and measured duration length perception. If the effect in H1 is driven by the perceived duration account, the duration marker would have an effect on perceived duration irrespective of whether consumers are making judgments and decisions for themselves, or for other people. However if it is driven by the mindset account, since people could only experience the implementing tendency for their own future actions and not for outcomes of others, we would expect duration marker to affect duration length perception only when people are judging their own future events. We manipulated the date of target event by setting it either in the present week (before-marker) or the next week (after-marker), while keeping the actual duration constant.

One hundred and ninety-two undergraduate students (96 females) from a North American university participated in this study.

Method

Participants were asked to put themselves in one of the following scenarios.

Dental visit (negative event): It is now Monday morning [Friday morning]. You [Dan, a bus driver in your city] checked your [his] schedule book, and found that you have [he has] a dentist appointment for regular check-up this Friday [next Tuesday].

Friend's visit (positive event): It is now Monday morning [Friday morning]. You [Dan, a bus driver in your city] checked your [his] schedule book, and found that that your [his] best friend from high school will visit this Friday [next Tuesday].

After reading the scenario, participants reported their duration perception by responding to the following question; *How close do you feel your dental visit / Dan's dental visit / your best friend's visit / Dan's best friend's visit is from now? (1 = extremely close, 9 = extremely far away).*

We also measured participants' general attitude towards dental visit (*Generally speaking, how painful do you think a dental visit is? 1= not painful at all, 9 = extremely painful*) or best friend's visit (*Generally speaking, how enjoyable do you think a best friend's visit is? 1= not enjoyable at all, 9 = extremely enjoyable*). These measures did not vary significantly across experimental conditions, and thus were excluded from further analysis.

Results and Discussion

A 2 (actor: self vs. other) X 2 (event location: before-marker vs. after-marker) X 2 (event valence: positive vs. negative) ANOVA on duration length perception did not yield a significant three-way interaction. For ease of exposition, therefore, we present analysis separately for the dental visit and the best friend's visit conditions. The mean duration perception scores are plotted in figure 3.

Insert figure 3 here

Dental Visit A 2 (actor: self vs. other) X 2 (event location: before-marker vs. after-marker) ANOVA on duration perception yielded a significant interaction effect ($F(1, 92) =$

12.63, $p < .01$), a significant main effect of actor ($F(1, 92) = 14.69, p < .001$), and a significant main effect of event location ($F(1, 92) = 5.95, p < .05$). As figure 3 shows, when the actor was self, participants in the before-marker condition ($M = 4.63, SD = 1.53$) perceived the event to be closer than those in the after-marker condition ($M = 6.42, SD = 1.50$), $t(46) = 4.01, p < .001$; whereas when the actor was someone else, duration length perception did not differ between before-marker ($M = 4.54, SD = 1.38$) and after-marker ($M = 4.21, SD = 1.44$) conditions.

Friend's visit A 2 (actor: self vs. other) X 2 (date of event: before-marker vs. after-marker) ANOVA on duration perception yielded a significant interaction effect ($F(1, 92) = 5.32, p < .05$) and a significant main effect of actor ($F(1, 92) = 40.46, p < .001$). As figure 3 shows, when the actor was self, participants in the before-marker condition ($M = 5.38, SD = 1.55$) perceived the event to be closer than those in the after-marker condition ($M = 6.42, SD = 1.38$), $t(46) = 4.01, p < .001$; whereas when the actor was someone else, duration length perception did not differ between before-marker ($M = 4.17, SD = 1.40$) and after-marker ($M = 3.83, SD = 1.49$) conditions.

These results were consistent with H2b, and did not support H2a. Consequently, Study 3 implicated that the reason that consumers in our previous studies showed a stronger willingness to initiate a task in the before-marker condition was because outcomes in the same period as the present directly put them in an implemental mindset, rather than via changing perceived duration to the outcome. In the following studies, we attempted to test other consequences of the mindset account.

STUDY 4

Besides the tendency to initiate a task, another consequence of implemental mindset is eagerness to complete the focal task, for example, a consumption experience. Therefore in study 4 we examined the effect of duration marker on people's eagerness to consume a cake.

Ninety-five undergraduate students (65 females) in China participated in a study that ostensibly studied the attractiveness of several gifts. This study used a 2 (salient marker: Christmas Day vs. New Year's Day) X 2 (consumption day: Dec. 28th vs. Jan. 4th) between-subject design. We manipulated the salience of marker by marking either *Christmas Day* or *New Year's Day* on a calendar that was displayed in the laboratory and shown to participants (see Figure 4 for details). The study was conducted on December 15th, therefore Dec. 28th would be before [after] the marker when *New Year's Day* [*Christmas Day*] was marked on the calendar. On the contrary, January 4th was always after the marker regardless of which festival was made salient. We predicted that people would be less patient when the target consumption was to occur before the salient duration marker.

Insert figure 4 here

Method

All participants were asked to imagine having won a gift certificate from a bakery. The certificate could be redeemed for a cake worth ¥18 (about \$3). We first measured the perceived attractiveness of the gift certificate (*1 = not attractive at all, 9 = extremely attractive*). The

perceived attractiveness did not vary across conditions and hence was excluded from further analysis.

Next participants were told that the certificate was redeemable only on December 28th [January 4th] and were shown a calendar to provide context. As shown in Figure 4, either *Christmas Day* or *New Year's Day* was marked on the calendar. We then measured participants' a) eagerness to consume the cake ($1 = \textit{not eager at all}$, $9 = \textit{extremely eager}$), b) patience of waiting for the consumption ($1 = \textit{not patient at all}$, $9 = \textit{extremely patient}$) (reverse coded), and c) the maximum amount of extra fee they would like to pay to expedite the consumption to tomorrow. Finally, we measured the perceived temporal distance from the consumption day ($1 = \textit{extremely close}$; $9 = \textit{extremely far away}$).

Results and Discussion

Since “eagerness” and “patience” (reverse coded) were highly correlated ($r=.69$, $p < .01$), we collapsed them into IMPATIENCE ($1 = \textit{not impatient at all}$, $9 = \textit{extremely impatient}$). Mean IMPATIENCE scores are plotted in Figure 5A. A 2 (salient marker) X 2 (consumption day) ANOVA on IMPATIENCE yielded a significant interaction effect ($F(1, 91) = 6.71$, $p < .05$). Specifically, when the consumption day was December 28th, people in *New Year's Day* condition (before-marker) were more impatient ($M = 4.90$, $SD = 2.23$) than those in the *Christmas Day* condition (after-marker) ($M = 3.74$, $SD = 1.39$), $t(43) = 2.06$, $p < .05$; whereas when the consumption day was January 4th, consumption impatience did not differ between *New Year's Day* condition ($M = 3.48$, $SD = 1.96$) and *Christmas Day* condition ($M = 4.34$, $SD = 1.80$), $t(48) = 1.60$, ns. Since the consumption days for people in Christmas Day - Dec. 28th, Christmas Day -

Jan. 4th”, and New Year’s Day - Jan. 4th conditions were all after the marker, we combined them as an after-marker condition. Likewise, we labeled the New Year’s Day - Dec. 28th as before-marker condition. We found that people in before-marker condition were more impatient ($M = 4.90$, $SD = 2.23$) than those in after-marker condition ($M = 3.82$, $SD = 1.77$), $t(93) = 2.40$, $p < .05$.

A 2 (salient marker) X 2 (consumption day) ANOVA on the maximum amount of extra fee people would like to pay to expedite the consumption yielded a significant interaction effect ($F(1,91) = 5.37$, $p < .05$). Mean willingness to pay (WTP) amounts are plotted in Figure 5B. Specifically, when the consumption day was December 28th, people in *New Year’s Day* condition (before-marker) were willing to pay more ($M = 2.12$, $SD = 1.92$) than those in the *Christmas Day* condition (after-marker) ($M = 1.10$, $SD = 1.30$), $t(43) = 2.08$, $p < .05$; whereas when the consumption day was January 4th, WTP did not differ between *New Year’s Day* condition ($M = 1.29$, $SD = 1.68$) and *Christmas Day* condition ($M = 2.00$, $SD = 2.27$), $t(48) = 1.31$, ns. ($p = .23$). We combined the conditions in the same manner as we did in analyzing the IMPATIENT data, and found that people in the before-marker condition would like to pay marginally more to expedite the consumption ($M = 2.13$, $SD = 1.92$) than those in the after-marker condition ($M = 1.45$, $SD = 1.80$), $t(93) = 1.56$, $p = .12$.

Insert figures 5A and 5B here

We also conducted a 2 (salient marker) X 2 (consumption day) ANOVA on perceived duration length, and found neither an interaction effect nor main effects: Christmas Day - Dec.

28th (M = 5.14, SD = 2.01), Christmas Day - Jan. 4th (M = 5.68, SD = 1.59), New Year's Day - Dec. 28th (M = 5.33, SD = 1.86), and New Year's Day - Jan. 4th (M = 5.71, SD = 2.26), respectively.

These results were consistent with H3, and further supported the mindset account.

STUDY 5

The objectives of study 5 were twofold. Firstly, we aimed to explore another behavioral consequence of duration marker - task commitment. Secondly, we manipulated duration marker perceptually by using different calendar formats (see Figure 7). This study was conducted on January 13th, 2011 (a Thursday) and the date of the date of target event in this study is January 16th, 2011 (a Sunday). Both the experiment day and the target event were in the same week. In the before-marker condition, we used the same background color for this week, whereas in the after-marker condition, we used one background color for weekdays and another background color for weekends. We reasoned that when the background colors of “today” and the “date of target event” were the same, people would perceptually group the two dates into one period, thus the target event would be perceived to occur before the marker of current period; whereas when the background colors were different, people would perceive the two dates in two periods - that said, the target event seemed to occur after the marker of current period.

Insert figure 6 here

Study 5A

This study used a one-way (event location: before-marker vs. after-marker) between-subject design. Forty-seven undergraduate students (26 females) from a North American university participated in it.

Method

Participants were given the following scenario:

*Imagine that you have promised a friend to help her move on **January 16th**, and today is January 13th. However, you have just received an email saying that on the 16th, there will be a career development event, which you think might be beneficial. Since the event will last all day long, you have to choose between helping your friend move and attending this event.*

After reading this, participants indicated a) the likelihood that they would still help friend move (*1 = very unlikely, 9 = very likely*) and b) how guilty they would feel if unable to keep promise (*1 = not guilty at all, 9 = very guilty*). We also measured perceived importance of friendship and career respectively (*1 = not important at all, 9 = very important*) for control. Since these two variables did not differ across experimental conditions or within individuals, they were excluded from further analysis.

Results and Discussion

Participants in the before-marker condition were more likely to help friend move ($M = 6.78$, $SD = 1.13$) and felt more guilty if unable to keep promise ($M = 7.78$, $SD = 1.09$) than their counterparts in the after-marker condition ($M = 4.46$, $SD = 1.44$; $M = 3.46$, $SD = 1.10$; respectively), $t(45) = 6.13$, $p < .001$; $t(45) = 13.54$, $p < .001$, respectively.

STUDY 5B

This study used a one-way (event location: before-marker vs. after-marker) between-subject design. Fifty-two undergraduate students (29 females) from a North American university participated in this study.

Method

Participants were given the following scenario:

*Imagine that you have purchased a ticket for a concert by your favorite band. The concert is on **January 16th**, and today is January 13th. However, an advisory on the weather forecast channel said that there would be a blizzard on the 16th. Given this, your 20 kilometer trip to the concert might be inconvenient and even dangerous. You can brave the weather, or cancel.*

After reading this, participants indicated a) the likelihood that they would still go to the concert ($1 = \text{very unlikely}$, $9 = \text{very likely}$) and b) the likelihood that they would be to sell the ticket if possible ($1 = \text{very unlikely}$, $9 = \text{very likely}$). We also measured event importance (*In general, how important is it for you to go to a concert by your favorite band?* $1 = \text{not important}$

at all, 9 = very important). Since it did not differ across experimental conditions or within individuals, it was excluded from further analysis.

Results and Discussion

Participants in the before-marker condition reported a higher likelihood of going to the concert ($M = 5.73$, $SD = 1.99$) and lower likelihood of selling the ticket ($M = 4.69$, $SD = 2.00$) than those in the after-marker condition ($M = 4.42$, $SD = 2.08$; $M = 5.77$, $SD = 2.02$; respectively), $t(50) = 2.31$, $p < .05$; $t(50) = 1.93$, $p = .06$, respectively.

Taken collectively, studies 4 and 5 supported H3. Consistent with the idea that outcomes occurring before a salient duration marker put people into an implemental mindset, we find that respondents were more impatient to consume a product, as well as more committed to a task, when the target event occurs before the marker.

GENERAL DISCUSSION AND CONCLUSIONS

In this paper, we studied a consumer who needs to accomplish a certain task that is due D days from now. Does the motivation to start working on that task change if the D -day duration ends in the same period as the present, or in the next period? In a series of experiments, we studied a variety of situations in which participants act on an outcome that would occur D -days away. These outcomes included opening a bank account and accumulating funds in it (Study 1A), completing a project (Study 1B), traveling to a beach resort (Study 2), visiting a dentist or getting together with a friend (Study 3), consuming a cake (Study 4), helping a friend move

(Study 5A), and braving the weather to a concert (Study 5B). In each experiment, we made a duration marker salient such that the D-day interval was punctured by the marker in some conditions but not others. We used several different ways to manipulate markers – we made naturally occurring markers more salient, and we also used semantic techniques and visual categorization techniques to get participants to process the same D-day interval differently. Our experiments showed that a) participants were more motivated to commence a task whose deadline was before a duration marker rather than after it, b) participants displayed a greater implemental mindset when the outcome was before a duration marker, c) there was no systematic effect of the duration marker on the perceived duration of time till the outcome, and d) participants were more committed to a task and more impatient to consume the outcome when these events were to happen before a duration marker relative to after the marker. We obtained our results using both field and laboratory experiments, with real choices as well as with hypothetical choices, using student participants as well as adults, and with data collected in North America, India and China.

A rich stream of literature has studied the manner in which consumers and organizations plan tasks and work towards an end goal. While varying in approaches and the underlying theoretical paradigms (which include psychology, organizational behavior, strategy and operations research), the research is consistent in suggesting that people should actively plan task by compartmentalizing time and assigning different tasks into different time periods. For instance, prescriptive texts on project planning (e.g., Grünig and Kühn 2010; Lewis 2010) recommend that a) large unstructured tasks be broken down into discrete sub-tasks, b) sub-tasks be structured to be done sequentially over a period of time, c) each sub-task be assigned to a specific window of time, and d) while plans for sub-tasks in the future be drawn up, the focus

should predominantly be on completing the sub-task assigned to the present time period. Indeed, a considerable amount of evidence suggests that in implementing projects, agents should actively implement the tasks that are part of the present phase while putting future tasks on the metaphorical back burner.

Our research suggests that the reverse phenomenon may also be at work. While the project planning research shows that people accomplish tasks by compartmentalizing time and assigning different tasks into different time periods, we show that task stages could be reversely and passively decided by compartmentalized time periods. Our work differs from traditional goal setting and task management literature (e.g., Lewis 2010; Locke and Latham 1990) in that the focal tasks in current period are set by external cue (i.e., duration marker), rather than conscious planning.

Our findings contribute to the literature on the psychology of time. We found that while time elapses continuously, its mental representation could be categorical. In our experiments, the presence of naturally occurring, semantically primed or perceptually primed markers caused people to behave as if they categorized time into the “now” and the “later” periods. In particular, events in the “now” category carried a greater sense of urgency than events in the “later” category. Indeed, this representation of time is a relatively simple and parsimonious representation of hyperbolic discounting (Zauberman et al. 2009) as the steep part of the hyperbolic discounting curve can be captured by the “now” and the gentle slope by the “later” (Soman et al. 2004). Since people often make decisions based on how they encode time, our findings shed new lights on understanding time-related decisions. For example, it is possible that choices between smaller-sooner (SS) and larger-later (LL) rewards are also affected by the presence of duration markers. In particular, it is likely that if both SS and LL are on the same

side of the marker, they would be in the same category. On the other hand, if LL is after a marker while SS is before, the SS option might loom larger and hence people might appear to be more impatient. Future research could further investigate the relationship between duration markers and different types of intertemporal choice tasks.

In the present research, we only made one duration marker salient at a time. An extension of this research could examine situations in which multiple markers might be activated. A simplistic extension of our theorizing would suggest that the more duration markers that the deadline is before, the more implemental the mindset is and the more likely people are to get started on the task at hand. That said, it is also likely that some markers might play a bigger role than others (for instance, for a farmer in India, the end of the harvesting season may play a bigger role than the end of the calendar year) in which case the effects of multiple markers might not be simply additive.

Finally, our research also contributes to the choice architecture literature (Thaler and Sunstein 2008) by showing a large impact of a subtle environmental cue on behavior. Given the ubiquity of marker in real life (e.g., holiday, birthday, semester for student, harvesting seasons for farmers) and the relative ease of manipulating markers (e.g., semantic priming, perceptual priming), our findings give room for optimism about using duration markers to nudge people to manage their tasks better.

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FIGURE 1: STUDY 1B RESULTS

THE EFFECT OF DURATION MARKER ON WILLININGNESS TO COMMENCE THE CONSULTING PROJECT (1 = DEFINITELY NOW)

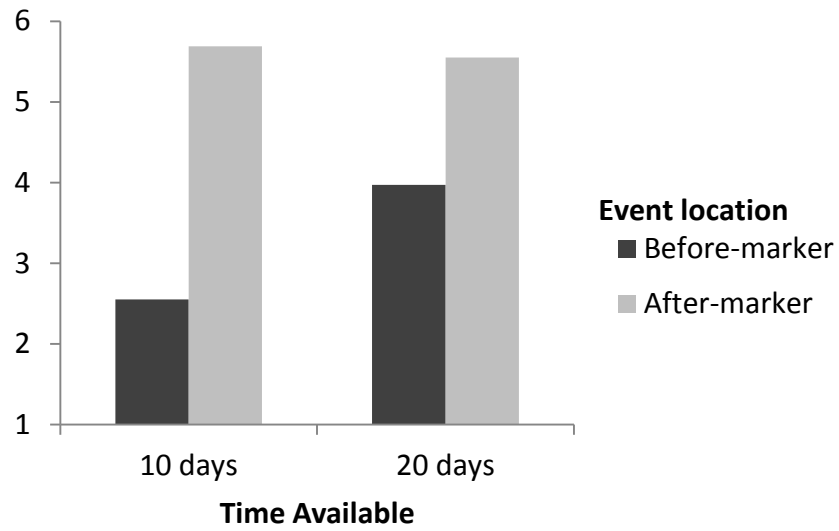


FIGURE 2: THE FOLLOW-UP OF STUDY 1 RESULTS

THE EFFECT OF DURATION MARKER ON WILLINGNESS TO COMMENCE THE
DATA ENTRY JOB (1 = DEFINITELY NOW)

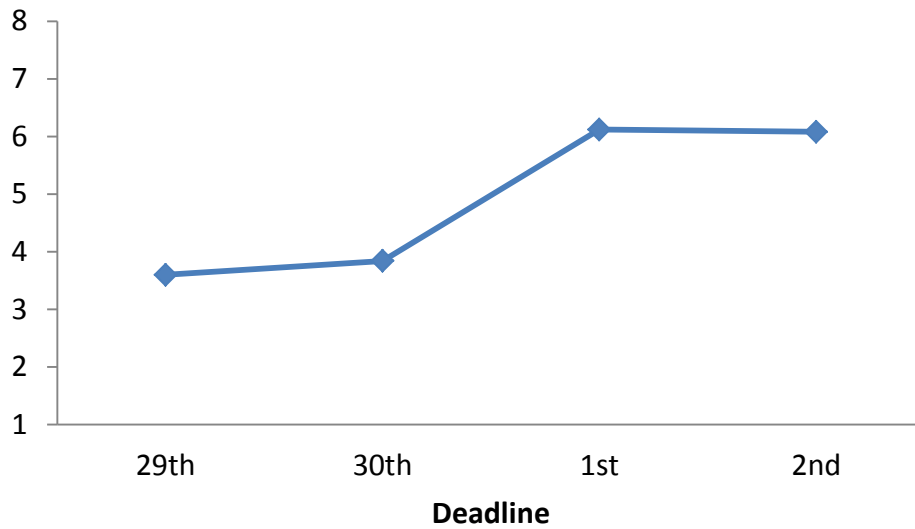


FIGURE 3: STUDY 3 RESULTS

DURATION LENGTH PERCEPTION AS A FUNCTION OF EVENT LOCATION AND
ACTOR

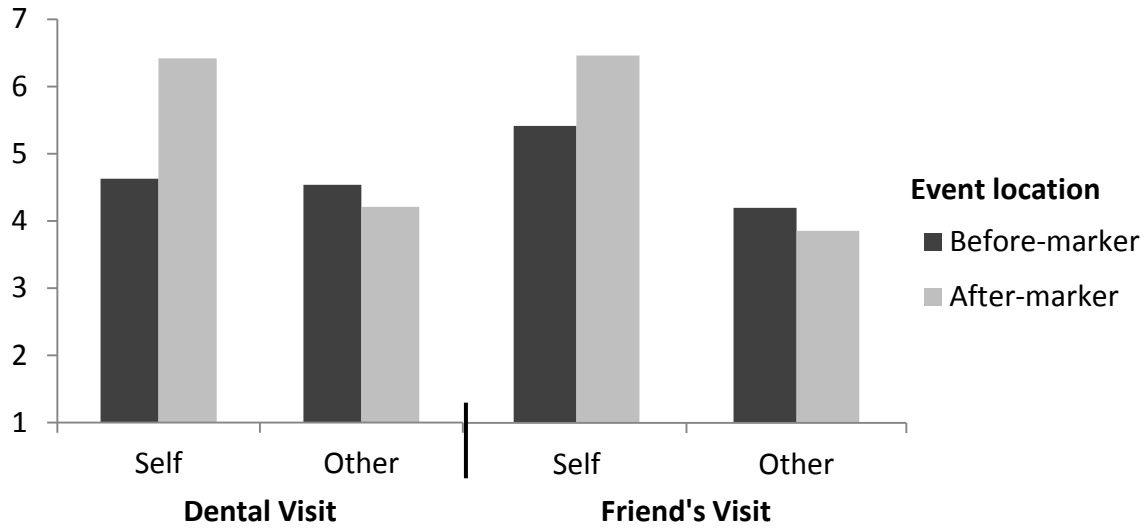


FIGURE 4: MANIPULATION OF DURATION MARKER (STUDY 4)

FIGURE 4A: CHRISTMAS DAY IS SALIENT

Dec. 2010							Jan. 2011						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
		1	2	3	4	5						1	2
6	7	8	9	10	11	12	3	4	5	6	7	8	9
13	14	15	16	17	18	19	10	11	12	13	14	15	16
20	21	22	23	24	25	26	17	18	19	20	21	22	23
27	28	29	30	31	Christmas Day		24	25	26	27	28	29	30

FIGURE 4B: NEW YEAR'S DAY IS SALIENT

Dec. 2010							Jan. 2011						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
		1	2	3	4	5						1	2
6	7	8	9	10	11	12	3	4	5	6	7	8	9
13	14	15	16	17	18	19	10	11	12	13	14	15	16
20	21	22	23	24	25	26	17	18	19	20	21	22	23
27	28	29	30	31	New Year's Day		24	25	26	27	28	29	30

FIGURE 5A: STUDY 4 RESULTS (IMPATIENCE)

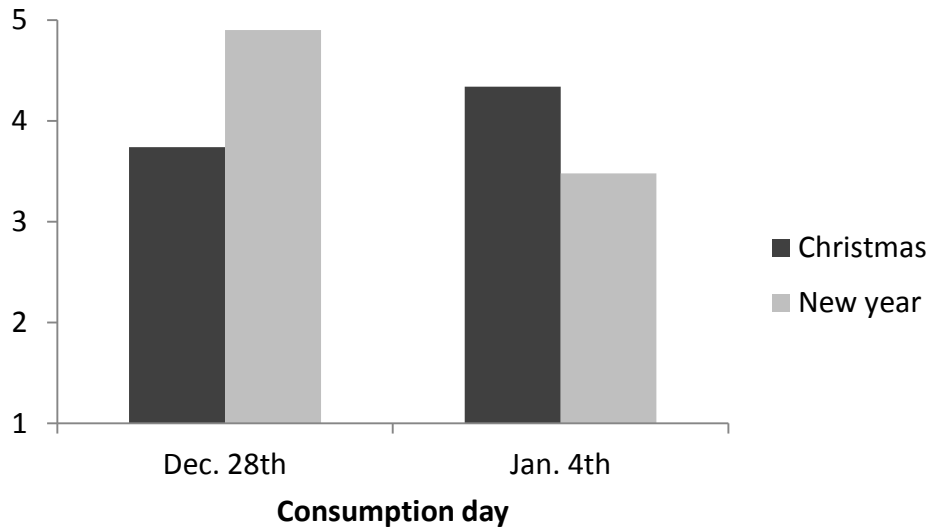


FIGURE 5B: STUDY 4 RESULTS (EXTRA FEE)

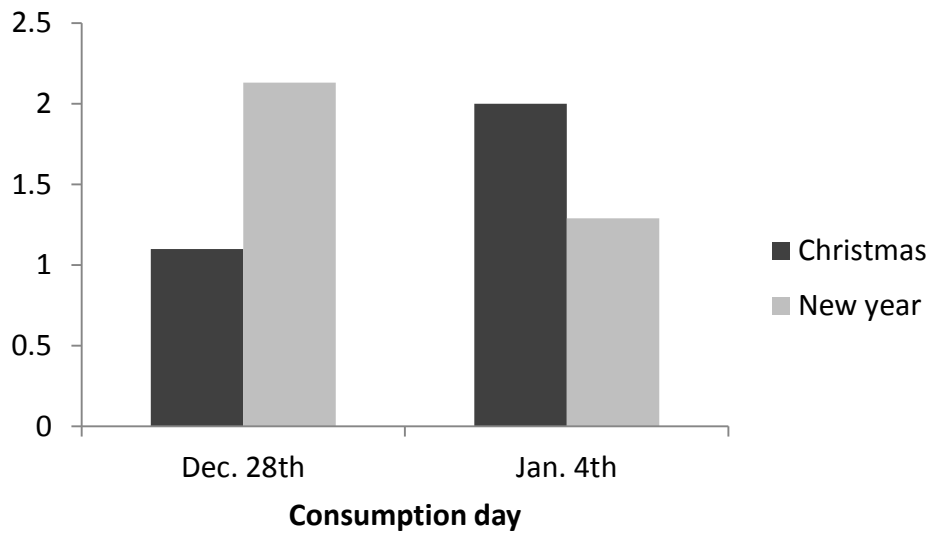


FIGURE 6: MANIPULATION OF DURATION MARKER (STUDY 5)

Jan. 2011						
Mo	Tu	We	Th	Fr	Sa	Su
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Target event occurs **before** marker
of current period

Jan. 2011						
Mo	Tu	We	Th	Fr	Sa	Su
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Target event occurs **after** marker
of current period