



Contents lists available at ScienceDirect

IJRM

International Journal of Research in Marketing

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

Full Length Article

The effect of start/end temporal landmarks on consumers' visual attention and judgments

Sheng Bi ^{a,*}, Andrew Perkins ^a, David Sprott ^b^a Carson College of Business, Washington State University, Pullman, WA 99163, USA^b College of Business, University of Wyoming, Laramie, WY 82071, USA

ARTICLE INFO

Article history:

First received on February 23, 2019 and was under review for 4½ months
Available online 8 June 2020

Area Editor: Vikas Mittal

Keywords:

Temporal landmark
Attentional focus
Temporal-spatial congruity

A particular point in time can be framed as either the start or end of a given time period. However, limited research is available on how such temporal landmarks influence consumers' judgments. This research addresses this issue by investigating how start vs. end temporal landmarks influence consumers' attentional focus and subsequent judgments. Six studies demonstrate that framing a temporal landmark as the start of a time period shifts visual attention to the left, while framing a temporal landmark as the end of a time period shifts visual attention to the right. By changing attentional focus within the visual-spatial environment, a temporal-spatial congruity between a temporal landmark (start vs. end) and the location of a target object (left vs. right) increases people's preference for that target object. Overall, these findings provide valuable implications for marketing theory and practice.

© 2020 Elsevier B.V. All rights reserved.

1. Introduction

The same point in time can be framed as either the start or end of a given time period. For example, students might frame the end of August as the end of summer or the start of a new school semester. The middle of February marks the end of the Chinese lunar calendar, while this point in time is also used by many firms to promote their “new for Spring” product offerings. While framing points in time as a start or an end is relatively common across cultures generally and in marketing specifically, little to no research has examined the effects of this type of temporal framing on consumer behavior, resulting in a number of interesting research questions. For example, will consumers' reactions differ when presented with a promotion framed as a start versus an end of a period of time? Will different time frames change consumer's preferences? If yes, why? These questions have clear strategic importance to marketers but have not been explored by marketing researchers. The current research aims to address these research questions by examining the effects of temporal landmark on attentional focus and subsequent consumer perception and behavior.

Temporal landmarks refer to those points in time that “stand out more starkly than others on socially shared calendars or personal life timelines” (Dai, Milkman, & Riis, 2014; Shum, 1998). Previous research has shown that temporal landmarks can significantly influence individuals' self-image (Peetz & Wilson, 2014), self-improvement motivation (Dai et al., 2014), and psychological resources allocation (Kouchaki & Smith, 2013). Differing from previous research on temporal landmarks, the current work explores how framing temporal landmarks as either the start- or endpoint of a time period changes people's attentional focus and subse-

* Corresponding author.

E-mail addresses: sheng.bi@wsu.edu, (S. Bi), a.perkins@wsu.edu, (A. Perkins), dsprott@uwyo.edu. (D. Sprott).

quent judgments. Specifically, we compare the impact of *start* temporal landmarks (a point in time that signals the start of a time period) to *end* temporal landmarks (a point in time that signals the end of a time period). We propose that making a start temporal landmark salient will shift consumers' attention to the left, while making an end temporal landmark salient will shift consumers' attention to the right. By shifting attentional focus (left versus right) via temporal landmark framing (start versus end), a match between attentional focus and the location of a target object should increase preference for that target object via perceived ease of processing.

We conducted six studies to test these research questions. The first two studies explored the main effect of temporal landmark framing on consumers' preference for products on the left (right) side of a visual-spatial environment, in both a physical (study 1a) and online (study 1b) retailing context. Studies 2a and 2b examined the mechanism underlying this temporal-spatial congruity effect. In study 2a, we found that participants remembered more products on the left (right) side of an advertisement when a temporal landmark was framed as the start (end) of a specific time period. In study 2b, we showed that consumers spent less time locating a target product in a complex print advertisement when the visual-spatial location of the target product was congruent with temporal landmark framing. The final two studies were conducted to examine applications of our temporal-spatial congruity effect. In study 3, we manipulated attentional focus and found that participants prefer dates that represent the start (end) of a time period to deliver a gift to their friends when their attention is manipulated to focus on the left (right) side. In study 4, we manipulated product orientation and found that participants reported more favorable attitudes when product orientation matched a specific temporal landmark. Taken together, these results reveal a heretofore unexplored effect of temporal landmark framing on perception that we observe using a subjective measure (product attitude, study 4), an objective measure (actual search time; study 2b), and several behavioral measures (real choice in study 1a and study 1b, product recall in study 2a, choosing a delivery date in study 3).

Our research contributes to the marketing literature and managerial practice in several ways. First, we extend existing temporal landmark research (Dai, Milkman, & Riis, 2015; Kivetz, Urminsky, & Zheng, 2006) by examining the effects temporal landmark framing on consumers' perception and behavior. In contrast to prior work, the current research examines the effects of temporal landmark framing in a wide range of marketing and consumption settings (e.g., advertising, retailing, and delivery). We also enrich the temporal landmark literature by examining the impact of temporal landmark framing on consumers' attentional focus and subsequent judgement. Second, our work contributes to prior research on attentional focus which has shown that physical movement, either in the same modality (eye movement, Shen & Rao, 2016) or in a different modality (hand or arm movement, Shen & Sengupta, 2013), can influence visual attention. The present paper identifies a new antecedent to shifting attentional focus, namely temporal landmarks. Finally, by highlighting consumer perceptions and behaviors that differ due to the specific framing of a temporal landmark (for example, signalling the start versus end of a time period), our research provides important implications for managers when considering the selection and framing of a specific point in time to more effectively promote their products.

The remainder of the current paper is organized as follows: First, we review the relevant literature on temporal landmarks, then generate predictions about how temporal landmark framing influences consumers' attention and subsequent behavior. We then present six studies to explore our proposed temporal landmark effect. Finally, we conclude with a discussion of the theoretical and practical implications of our findings.

2. Conceptual development

2.1. The effect of temporal landmarks on perception

Previous research has noted three types of temporal landmarks: vivid public events that may or may not involve the self (e.g., 2008 Summer Olympic Games in Beijing, a national election), significant personal events (e.g., birthdays, graduation), and calendar reference points (e.g., New Year's Day, Christmas; Shum, 1998). Each type of temporal landmark can have a significant impact on a person's cognitive judgments (Dai et al., 2014, 2015; Peetz & Epstude, 2016; Peetz & Wilson, 2013, 2014; Zauberman, Levav, Diehl, & Bhargave, 2010). For example, a person may perceive a past public event as more distant when the number of meaningful intervening event-related markers increases (Zauberman et al., 2010). Different from public events, significant personal events refer to those life events that are meaningful and important to one's personal history, such as life transitions and first experiences (Dai et al., 2015). For example, Dai et al. (2015) found that when people imagined they had moved to a new apartment (a start temporal landmark), they were more motivated to pursue a personal goal because they felt more psychologically separated from their past self. However, because people have different life experiences, religious, or political beliefs, they are likely to experience the same events idiosyncratically. Therefore, examining the impact of vivid public events or significant personal events may limit practical implications.

In the present paper, we explore a more robust temporal landmark effect using calendar reference points. Calendar reference points refer to points on socially constructed and shared timetables, such as Christmas, New Year's Day, or the beginning of a college semester. These calendar reference points have been shown to affect behavior in previous research. For example, individuals are more likely to search Google for the term "diet" at a start of time period, such as the first day of a month (Dai et al., 2014). Thus, examining calendar reference points and their effects on consumer behavior might be more informative and useful compared to vivid public events or personal events, especially for marketers.

Additionally, previous research suggests that temporal landmarks can structure a person's perception of identity (Peetz & Wilson, 2013, 2014) and their memories (Kurbat, Shevell, & Rips, 1998). For example, Peetz and Wilson (2013) found that

temporal landmarks can help people categorize their lives into different chunks (e.g., the first day of high school through to graduation might be categorized together as “high school time”). Not only can temporal landmarks define distinct time periods, they can also define separate self-identities. For example, when a temporal landmark is made salient, one's future self is perceived as less connected to, and more dissimilar from, one's current self (Peetz & Wilson, 2014). When future selves are undesirable, people are more likely to spontaneously use temporal landmarks to create a psychological separation between the present self and an undesirable future self (Peetz & Wilson, 2014).

Finally, researchers have examined the effect of temporal landmarks that signal a particular meaning, such as temporal landmarks that designate the beginning or end of a time period. For example, extant research has demonstrated that those at the start of a new time period will report stronger intentions to pursue aspirational behaviors (Dai et al., 2014; Hennecke & Converse, 2017; Kouchaki & Smith, 2013; Touré-Tillery & Fishbach, 2015). Two distinct mechanisms have been put forward to explain this effect. The first mechanism adopts a psychological resource perspective, such that those at the beginning of a time period are thought to have more self-regulatory resources (Kouchaki & Smith, 2013). For example, Hennecke and Converse (2017) found that planners have higher initiation expectations due to more resources and fewer constraints derived from the beginning of a time period. The second mechanism focuses on self-identity. Touré-Tillery and Fishbach (2015) found that people will be more self-diagnostic at the beginning of a time period, which increases the probability of self-control behaviors. Dai et al. (2015) found that a salient beginning temporal landmark increased subjective distance between the current-self and the imperfect past-self, which increased goal-pursuit motivation. Several researchers have also examined effects related to end temporal landmarks. For example, based on the goal-gradient hypothesis (Hull, 1932), Kivetz et al. (2006) found that people expend more efforts and have a stronger tendency to accelerate when that end point is temporally close. Zhu, Bagchi, Hock, and Diehl (2018) suggested a mere deadline effect, where a long versus incidental deadline for a pre-set goal increased the amount of resources committed to the attainment of that goal.

Taken together, the extant temporal landmark literature suggests that such landmarks can significantly impact people's self-evaluation, goal-pursuit, sense of resource availability, and resource allocation. The present research builds on previous research by exploring the impact of temporal landmark framing on attentional focus and subsequent judgement and decision making. Specifically, we explore a more robust temporal landmark framing effect by manipulating the perception (i.e., framing) of a particular point in time. We propose that different types of temporal landmark framing (e.g., start versus end) can change individuals' visual attention. Specifically, we suggest that a temporal landmark framed as the start of a time period shifts a person's attentional focus to the left, while a temporal landmark framed as the end of a time period shifts attentional focus to the right side of a visual-spatial environment. Second, rather than focusing on only a start (or an end) temporal landmark in previous research, we compare start temporal landmarks with end temporal landmarks and propose a temporal-spatial congruity effect. In particular, we hypothesize that a match between different temporal landmarks (start or end) and the location of a target object (left or right) should increase preference for that target object, and explore the psychological mechanism that underlies this temporal-spatial congruity effect.

2.2. The spatial metaphor of time and temporal-spatial congruity

Metaphors are useful for understanding how temporal landmarks can impact consumer decision making. According to metaphorical mapping theory (Boroditsky, 2000; Lakoff & Johnson, 1980), people tend to use metaphors with more concrete or perceptually rich concepts to structure and understand abstract concepts (such as time). Thus, when people talk about time, they tend to use spatial metaphors. For example, when talking about past/future time, people tend to use a “back/front” metaphor (e.g., *back* to 1980s; *looking forward* to seeing you). The notion that spatial metaphors and concepts underlie a person's understanding of time perception has strong support in the literature (Boroditsky, 2000; Bottini, Crepaldi, Casasanto, Crollen, & Collignon, 2015; Eikmeier, Alex-Ruf, Maienborn, & Ulrich, 2015; Miles, Nind, & Macrae, 2010; Vallesi, Arbula, & Bernardis, 2014). For example, Ouellet, Santiago, Funes, and Lupiáñez (2010) found that priming the past or the future using words representative of these concepts affected individuals' attention to the left or the right, respectively.

Moreover, previous research has explored three temporal-spatial congruity effects. First, researchers have examined the congruity between short/long time durations and left/right representations. Vallesi, Binns, and Shallice (2008) found that participants responded faster when a short time duration was positioned on the left and a long time duration was positioned on the right. The second temporal-spatial congruity effect explored the relationship between ordered temporal concepts and left/right representations (Boroditsky, Fuhrman, & McCormick, 2011; Fuhrman & Boroditsky, 2010; Santiago, Román, Ouellet, Rodríguez, & Pérez-Azor, 2010). This research found that participants responded faster when “before” related words were positioned on the left side and “after” related words were positioned on the right side. Finally, a third set of findings demonstrated congruity effects between past/future and left/right representations (Chae & Hoegg, 2013; Ulrich & Maienborn, 2010), finding that participants responded faster when concepts related to “past” were on the left and “future” were on the right.

Extending this prior research by framing temporal landmarks as either the start or end of a time period, we suggest that how a temporal landmark is framed (e.g., as either the start or end of a time period) can change a consumer's attentional focus, subsequently affecting judgement and decision making. Specifically, we predict that a temporal landmark that represents the start or end of a time period will shift attention to either the left or to the right, respectively, resulting in congruity effects. Our proposed temporal-spatial congruity effect differs from previous research in two important aspects. First, temporal landmarks are independent of the actual time period of interest. Specifically, a temporal landmark can be framed as the start or the end of the same time

period, and independent of the length of that time period. For example, May 3rd, 2019 can be framed either as an end of a week (Friday; a short period of time) or a start of a month (May; a long period of time). Extending this example, at some American universities, May 3rd, 2019 is the end of spring semester, concluding a period of time that is much longer than either a week or a month. Thus, we suggest that our proposed temporal landmark effect is not the same as previously explored long/short-left/right congruity effects. Second, the temporal landmarks used in the current research frame the same point in time as either a start or an end point. For example, November 1st, 2019 can be framed as a start of a month (November) or an end of a week (Friday), and May 3rd can be framed as the end of a semester or the beginning of Summer. Thus, our temporal landmark effect focuses on the current time point and is distinct from previous research that explored before-after and past-future related landmarks.

2.3. The effect of start/end temporal landmarks on spatial attention

Why might different temporal landmarks affect spatial attention? First, extant research suggests that people spontaneously activate space-related concepts in memory when a temporal landmark is observed. Previous research has found that discreet stages of an ordered sequence (such as letters of an alphabet or months of the year) are usually associated with spatial representations (Gevers, Reynvoet, & Fias, 2003, 2004). For example, the initial objects in an ordered sequence (e.g., smaller numbers, the first letters of an alphabet, or earlier months on a calendar) are usually associated with the left side of a visual-spatial environment, while final objects in an ordered sequence are associated with right side of that visual-spatial environment. Consistent with this notion, and because time is typically described as an ordered sequence (Weger & Pratt, 2008), we predict that a start temporal landmark will be associated with the left side of a visual-spatial environment, while an end temporal landmark will be associated with the right side of a visual-spatial environment.

Next, we predict that framing temporal landmarks as either the start or end of a time period will influence people's attentional focus. Research on behavioral priming effects has demonstrated that concepts associated with the activated constructs in memory can influence behavior. For example, priming the Apple logo can lead people to perform more creatively in a subsequent task (Fitzsimons, Chartrand, & Fitzsimons, 2008); thinking about a nostalgic experience can make people more patient (Huang, Huang, & Wyer, 2016), and exposing someone to a fast food logo can increase reading speed (DeVoe, House, & Zhong, 2013). Importantly, priming an object in memory can increase attention toward that object in the visual-spatial environment (Labroo, Dhar, & Schwarz, 2007; Lee & Labroo, 2004). Thus, within the current context, we predict that when a temporal landmark is framed as the start of a time period, people will shift their attention to the left, while a temporal landmark that is framed as the end of a time period will cause people to shift their attention to the right, because the concept "start" is associated with the left side of a visual-spatial environment, while the concept "end" is associated with the right side of a visual-spatial environment.

Thus, based on the discussion above, we proposed the following hypothesis:

H1. When a temporal landmark is framed as the start of a time period, consumers will shift attention to the left side of a visual-spatial environment. When a temporal landmark is framed as the end of a time period, consumers will shift attention to the right side of a visual-spatial environment.

2.4. Temporal-spatial congruity and increased preferences

We predict that attentional shifts (left vs. right) due to different framing of temporal landmarks will increase preferences for objects observed in that same visual-spatial location. This expectation is supported by Shen and Sengupta's (2013) finding that auditory stimuli can shift visual attention, resulting in an increased preference for a visually processed item located in the same direction as the auditory stimulus. In a similar way, we argue that differential framing of temporal landmarks will shift a person's visual attention either to the left or right and thus it should feel easier to process an object located in the same perceptual space as that person's shifted attention. Moreover, this enhanced ease of processing is then misattributed to liking, resulting in a preference for the stimuli (Novemsky, Dhar, Schwarz, & Simonson, 2007; (Reber et al., 2004)). Thus, we propose a temporal-spatial congruity effect (Fig. 1):

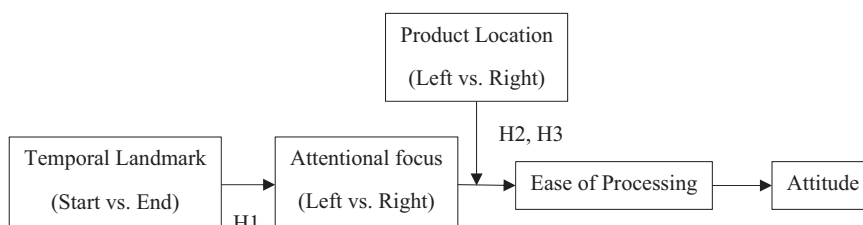


Fig. 1. Theoretical framework.

H2. Consumers will report more positive attitudes toward and preferences for objects appearing on the left (versus right) side after exposure to a temporal landmark framed as the start (versus end) of a time period.

H3. Perceived ease of processing will mediate the positive relationship between temporal-spatial congruity and attitudes toward and preferences for those objects.

3. Overview of studies

We conducted six studies to examine our hypotheses. In study 1, we examined our proposed temporal-spatial congruity effect in a physical retailing context (study 1a) and an online shopping context (study 1b). We predicted that a temporal landmark framed as the start of a time period will increase preferences for products on the left side of a visual-spatial environment, while a temporal landmark framed as the end of a time period will increase preferences for products on the right side. In study 2, we examined the mechanism that underlies our proposed temporal-spatial congruity effect. In study 2a, we tested how temporal landmark framing influences attentional focus (H1) via a recall task. We predicted that consumers would remember more products on the left (right) side when a temporal landmark is framed as the start (end) of a time period. In study 2b, we tested our proposed temporal-spatial congruity effect (H2 and H3). We predicted that when the target item (in this case, a product) is located in the same visual-spatial location as a person's shifted attention, that person will take less time to find that target item in busy advertisement. Further, this congruity effect should affect subsequent judgement of that object. In study 3, we tested our temporal-spatial congruity effect by manipulating attentional focus. We predicted participants would have a stronger preference for a particular delivery date when that date (framed as either a start or an end temporal landmark) matched that person's attentional focus. Finally, in study 4 we examined the temporal effect in a single product context. We predicted that when product orientation matches a person's attentional focus (shifted by the framing of a temporal landmark), consumers will report more favorable attitudes toward that product.

4. Study 1

Study 1 was designed to provide initial evidence that framing temporal landmarks as either the start or end of a time period can change people's preference for products presented on either the left or right of a visual-spatial environment. Study 1a was a field experiment. We created a pop-up store on campus to promote either a new semester sale (start temporal landmark condition) or an end of summer holidays sale (end temporal landmark condition). Our variable of interest was the location on a store display from which participants chose a bottle of water as compensation for participating. We predicted that consumers would be more likely to choose a bottle of water from the left side of the store display when we were promoting a start of new semester sale but would choose from the right side of the display when we were promoting an end of summer holidays sale.

Study 1b asked participants to choose from an array of products presented with either a start or end temporal landmark in the context of an online store. We predicted that consumers would be more likely to choose a product from the left side of the product array when it was paired with a start temporal landmark, but would choose a product from the right side of the array when it was paired with an end temporal landmark.

4.1. Study 1a

4.1.1. Participants and design

One hundred and four participants (50.96% females, $M_{\text{age}} = 22.01$) from a large university in United States participated in study 1a for monetary compensation. Participants were assigned to either the start or end temporal landmark condition in a single-factor (temporal landmark framing: start versus end) experimental design.

4.1.2. Procedure

Study 1a was completed during a single laboratory session, with the end temporal landmark condition running in the morning and the start temporal landmark condition running in the afternoon. Upon arrival, participants were first asked to complete a five-minute filler task. After completing the filler task, participants were guided by a research assistant to a "pop-up" store in a separate room. After seating the participant in the pop-up store, the research assistant read the following script: "We are planning to create a small pop-up store in the behavioral lab to sell stationary. We would like to collect some opinions about the store from students". The research assistant then gave participants a paper survey on a clipboard. The participants then completed the survey while sitting in front of the product display (please see [Appendix A](#)).

In order to manipulate the framing of the temporal landmark, participants saw a banner hanging above the product display describing either "start of new semester" (start temporal landmark condition) or an "end of summer holidays" (end temporal landmark condition). Below the banner, a product display with three shelves presented an array of products for the participant to observe. Participants viewed the products on each shelf and responded to questions concerning their overall attitude toward the pop-up store (1 = very negative, 7 = very positive), product placement on the shelf (1 = not in a good order, 7 = in a

good order), price of the products on the shelf (1 = too low, 7 = too high), and their general feelings about the sale presented on the banner (1 = very negative, 7 = very positive).

After completing the survey, participants were informed that they could choose a bottle of water from the top shelf as compensation for participation. The water bottles were presented in three rows of ten bottles each (ten bottles across, three bottles front to back). After choosing a bottle of water as compensation, participants exited the pop-up store, and were debriefed. The research assistant then recorded which bottle participants took and replaced the chosen water bottle.

4.1.3. Results

First, we conducted independent *t*-tests on our measures of overall attitude toward the pop-up store, product placement on the shelf, price of the products on the shelf, and participants' general feelings about the sale presented on the banner. Participants reported similar attitudes toward the pop-up store ($M_{\text{start}} = 5.72$, $SD = 1.07$, $M_{\text{end}} = 5.54$, $SD = 1.22$; $t(102) = 0.81$, $p > .1$), perceived the placement of the products similarly ($M_{\text{start}} = 5.09$, $SD = 1.52$, $M_{\text{end}} = 5.22$, $SD = 1.52$; $t(102) = -0.43$, $p > .1$), reported similar attitudes toward the prices of the products ($M_{\text{start}} = 3.69$, $SD = 0.93$, $M_{\text{end}} = 3.66$, $SD = 0.96$; $t(102) = 0.14$, $p > .1$) and reported similar feelings toward both sales banners ($M_{\text{start}} = 4.89$, $SD = 1.72$, $M_{\text{end}} = 5.18$, $SD = 1.21$; $t(102) = -0.99$, $p > .1$) between start and end temporal landmark conditions.

More central to our hypothesis, we conducted a chi-square analysis on the position of the chosen water bottle. We coded water bottles on the left side of the display as 0 and coded water bottles on the right side of the display as 1. Results suggested a marginally significant effect of temporal landmarks, which participants were more likely to choose a water bottle from the left side of the display in the start temporal landmark condition (38.89%) than those in the end temporal landmark condition (22%, $\chi^2(1) = 3.48$, $p = .06$). Additionally, no difference was found in the choice of row (front to back) from which the bottle was taken ($\chi^2(2) = 0.75$, $p > .1$).

Next, we conducted an independent *t*-test on water bottle location. Because we placed 10 bottles in the row, we coded the leftmost water bottle as 1 and coded the rightmost water bottle as 10. Similar to the results of chi-square analysis, a marginally significant difference between conditions obtained, such that participants in the end temporal landmark condition chose the water bottle on the right side ($M = 8.10$, $SD = 3.20$) more than those in the start temporal landmark condition ($M = 6.85$, $SD = 3.50$, $t(102) = -1.90$, $p = .06$).

4.1.4. Study 1a discussion

Study 1a provided initial evidence that framing temporal landmarks as either the start or the end of a time period can change consumer choice. Specifically, a temporal landmark framed as the start of a time period shifted individuals' preference to the left, while a temporal landmark framed as the end of a time period shifted individuals' preference to the right. Study 1a also revealed that participants have a general preference for objects on the right side no matter whether they were in the start temporal landmark condition or in the end temporal landmark condition. One potential reason is that the exit door of the pop-up store was on the right side of the shelf. After participants completed the survey, they moved toward the exit door and grabbed the water bottle at the same time. Thus, they might be more likely to choose the water bottle on the right side.

In order to rule out this alternative explanation, in study 1b we conducted a more controlled experiment to test the effect of temporal landmark framing on consumer preference.

4.2. Study 1b

4.2.1. Participants and design

Two hundred and nineteen registered Mturk users (49.3% females, $M_{\text{age}} = 33.98$) were recruited to take part in study 1b for monetary compensation. Study 1b was a 2 (temporal landmark framing: start versus end) \times 2 (product array counterbalance: right to left versus left to right) between-subjects design. Participants were randomly assigned to one of the four conditions.

4.2.2. Procedure

We conducted Study 1b on November 1st, 2019, a Friday. Participants were first told that, because this study was to be conducted at different times during the week, we needed to record the actual point in time participants completed the study. In the start temporal landmark framing condition, we asked participants to write down what the *date* they completed the study (the only correct answer was November 1st). In the end temporal landmark framing condition, we asked them what *day* of the week they completed the study, providing seven options to choose from (e.g., Monday, Tuesday, etc.; Friday was the only correct answer). We then asked whether participants perceived today (the day they participated) as the start or end of the time period as a manipulation check (slider scale, 1 = the start of a week/a month, 100 = the end of a week/a month).

Next, we presented participants a screen with an image (taken from an actual [Amazon.com](https://www.amazon.com) search, see [Appendix B](#)) of an array of five Christmas cards presented in horizontal display arranged from left to right. The order of the cards in the display was counterbalanced across conditions. We instructed participants to imagine they were going to purchase a Christmas card, and to choose one of the five options presented. Each of the five options was priced identically (\$13.99). Participants were asked to make their choice, respond to a standard set of demographic questions, debriefed, and paid.

4.2.3. Results

We first conducted an independent *t*-test on how participants across both conditions perceived their specific temporal landmark framing. Results revealed that when framing the November 1st as a start (e.g., the 1st day of November), participants were more likely to perceive it as a start of a time period ($M = 0.89$, $SD = 4.84$); however, when framing November 1st as an end (e.g., Friday), participants were more likely to perceive it as the end of a time period ($M = 96.45$, $SD = 8.26$, $t(217) = 104.11$, $p < .001$).

More central to our hypothesis, we coded participants' choice of Christmas card as a continuous variable (-2 = leftmost option, -1 = left option, 0 = middle option, 1 = right option, 2 = rightmost option) and conducted a 2×2 ANOVA with Christmas card choice as the dependent variable. Results revealed a significant effect of temporal landmark framing ($F(1,215) = 4.13$, $p = .043$). Specifically, participants preferred the option on the left side of the visual-spatial environment in the start temporal landmark framing condition (e.g., November 1st; $M = -0.22$, $SD = 1.31$), whereas they preferred the right option in the end temporal landmark framing condition (e.g., Friday; $M = 0.15$, $SD = 1.40$). No significant effects were found due to product array counterbalancing ($F(1,215) = 1.27$, $p > .1$), nor was the interaction between temporal landmark framing and product array counterbalancing significant ($F(1,215) = 0.24$, $p > .1$).

4.2.4. Discussion of study 1a and study 1b

In general, study 1 tested the idea that temporal landmark framing (as either the start or end of a time period) can shift consumer preference within a visual-spatial environment. The results of studies 1a and 1b provide convergent evidence for this effect. This relationship is robust across different contexts (e.g., a real-world pop-up store or an online retail environment) and using different manipulations of temporal landmark framing (start of a new semester/a month, end of summer holidays/weekdays).

In the next two studies, we explored the mechanism underlying the relationship between temporal landmark framing and consumer response. Specifically, we argue that a match between the location of an object in a visual-spatial environment and a person's shifted visual attention resulting from temporal landmark framing should result in easier processing of that object. This temporal-spatial congruity should result in a fluency effect, observable as reduced response time and/or increased recall in a consumption setting.

5. Study 2

Study 2 was designed to examine the mechanism underlying the relationship between temporal landmark framing and consumer response. Study 2a was designed to provide initial evidence of our temporal-spatial congruity effect. Specifically, we hypothesized that when a temporal landmark is framed as the *start* (*end*) of a time period, participants' attention will focus on the *left* (*right*) side of a visual-spatial environment. In study 2a, we used product recall as a measure of increased attention. Study 2b was designed to test H2 and H3. If temporal landmark framing changes attention, we should observe increased ease of processing (i.e., reduced search time) when participants are instructed to find a product located where that attention is focused. As previous research has shown that ease of processing can make individuals' attitude toward an object more positive (Lee & Labroo, 2004), we additionally predicted that participants will report more positive attitudes toward those products located in the temporal-spatially congruent location (in this case, within a busy advertisement).

5.1. Study 2a

5.1.1. Participants and design

One hundred and eight registered Mturk users (38% females, $M_{\text{age}} = 36.06$) were recruited to take part in study 2a for monetary compensation. Participants were randomly assigned to one of two temporal landmark framing (start versus end) conditions.

5.1.2. Procedure

After reading an initial instruction page, participants were told that they would be evaluating an advertisement for a grocery store. Participants were asked to imagine that they were a customer of this grocery store, and that they received an email advertising a three-day sale that either starts (start temporal landmark condition) or ends (end temporal landmark condition) today (see Appendix C). Participants viewed the advertisement for fifteen seconds, and then wrote down all of the products they could remember from the advertisement. After completing the recall task, participants answered a standard set of demographic questions, were debriefed, and paid.

5.1.3. Results and discussion

We excluded sixteen participants who wrote down random numbers or random words such as "good" or "products", resulting in 92 participants in our final analysis. A research assistant blind to the purpose of this study coded the location of products written down by the participants. An independent *t*-test on total number of recalled products across conditions was not significant ($t(90) = -0.34$, $p = .74$), suggesting that participants recalled the same number of total products across conditions ($M_{\text{start}} = 4.12$, $SD = 4.12$, $M_{\text{end}} = 3.93$, $SD = 3.93$). However, and more important to our research, participants in the start temporal landmark framing condition remembered more products on the left side of the flyer

($M = 2.66$, $SD = 1.60$) than participants in the end temporal landmark framing condition ($M = 2.07$, $SD = 1.58$, $t(90) = -1.77$, $p = .08$).

We also calculated an index using the number of products participants remembered on the left side divided by the total number of products participants remembered. Results indicated a significant effect of temporal landmark on percentage of products on the left side ($t(90) = -2.92$, $p = .004$).¹ Specifically, participants in the start temporal landmark framing condition remembered more products on the left side ($M = 0.69$, $SD = 0.24$) than participants in the end temporal landmark framing condition ($M = 0.52$, $SD = 0.32$), providing direct evidence that framing a temporal landmark as the start of a time period shifts attention to the left while framing a temporal landmark as the end of a time period shifts attention to the right.

5.2. Study 2b

5.2.1. Participants and design

One hundred fifty-six registered Mturk users (53.8% females, $M_{\text{age}} = 34.08$) were recruited to take part in study 2b for monetary compensation. Study 2b was a 2 (temporal landmark framing: start versus end) \times 2 (product location: left versus right) between-subjects design. Participants were randomly assigned to one of the four conditions.

5.2.2. Procedure

Study 2b was conducted on two different days: August 31st, 2019 and September 1st, 2019. At the beginning of this study, participants were told that they would be evaluating a product. Participants were presented with an image of a tub of margarine with the brand name “Becel”. Participants were then instructed that they would receive an advertisement from a local grocery store, and their task was to find the margarine on the advertisement. We manipulated temporal landmark framing by presenting the sale as either a “Start of September Sale” (start temporal landmark framing) or an “End of August Sale” (end temporal landmark framing). Additionally, we manipulated product location by placing the margarine on either the left or right side of the advertisement (see [Appendix D](#)). While participants attempted to find the margarine, we measured the length of time participants searched, measured in milliseconds. In this task, search time was used as a measure of ease of processing. After finding the margarine, we measured participants' attitudes (1 = very unfavorable, 7 = very favorable), purchase intention (1 = very unlikely, 7 = very likely), and familiarity (1 = very unfamiliar, 7 = very familiar) toward the “Becel” brand. Finally, participants answered a standard set of demographic questions, were debriefed, and paid.

5.2.3. Results

5.2.3.1. Ease of processing. A 2×2 ANOVA on time spent searching for the “Becel” margarine in the advertisement with brand familiarity included as a covariate revealed a significant interaction between temporal landmark framing and product location ($F(1,151) = 7.07$, $p = .009$).² No significant main effects of temporal landmark framing or product location were observed ($ps > .1$). More important to our theorizing, when the advertisement was labeled as a “Start of September Sale”, participants took less time to find the margarine on the left side ($M = 18.61$) compared to the right side ($M = 28.71$, $F(1,151) = 4.16$, $p = .043$) of the advertisement. Similarly, when the advertisement was labeled as an “End of September Sale”, participants took less time to find the margarine on the right side ($M = 18.76$) comparing to left side ($M = 27.43$, $F(1,151) = 3.10$, $p = .080$) of the advertisement.

5.2.3.2. Mediation analysis. We examined search time as a mediator between temporal landmark framing and brand preference following the PROCESS procedure suggested by Hayes, Model 8 (Hayes, 2017). Specifically, we included temporal landmark framing as the independent variable, product location as the moderator of the relationship between temporal landmark framing and search time, search time as the mediator, brand familiarity as a covariate, and our brand preference index (brand attitude and purchase intention combined, $r = 0.64$) as the dependent variable. Results revealed a significant interaction effect between temporal landmark and product location on participants' search time ($\beta = 18.78$, $t = 2.66$, $p = .009$), which then influenced the brand preference index ($\beta = -0.008$, $t = -1.72$, $p = .087$). The conditional indirect effect was negative and had a 95% confidence interval that excluded zero ($\beta = -0.15$, 95% CI = $[-0.3408, -0.0117]$; see [Fig. 2](#)). More importantly, the conditional indirect effect was significant when the product was located on the left side ($\beta = 0.069$, 95% CI = $[0.0085, 0.2393]$), or when the product on the right side ($\beta = -0.078$, 95% CI = $[-0.1973, -0.0004]$)³ of the advertisement. See [Fig. 2](#) below.

5.2.4. Discussion of study 2a and study 2b

Studies 2a and 2b provide evidence that supports H1, H2 and H3. Specifically, we found that when a temporal landmark framed as the start (or end) of a time period was matched with the congruent visual-spatial location of a product in an

¹ This index is normally distributed ($Z_{\text{kurtosis}} = -1.43$; $Z_{\text{skewness}} = -0.736$). However, neither the total number of recalled products ($Z_{\text{kurtosis}} = 5.76$; $Z_{\text{skewness}} = 5.60$) nor the number of recalled products on the left side ($Z_{\text{kurtosis}} = 5.08$; $Z_{\text{skewness}} = 5.09$) was normally distributed. After log transformation, t -test on logged total number of recalled products across conditions was still not significant ($t(90) = -0.58$, $p = .56$). However, an independent t -test on logged recalled products on the left side across conditions was significant ($t(90) = -2.16$, $p = .034$).

² The significant results still hold without using familiarity as control variable.

³ The sign is negative because we coded end temporal landmark condition as 1, start temporal landmark condition as 2; target product on the left side as 1, target product on the right side as 2.

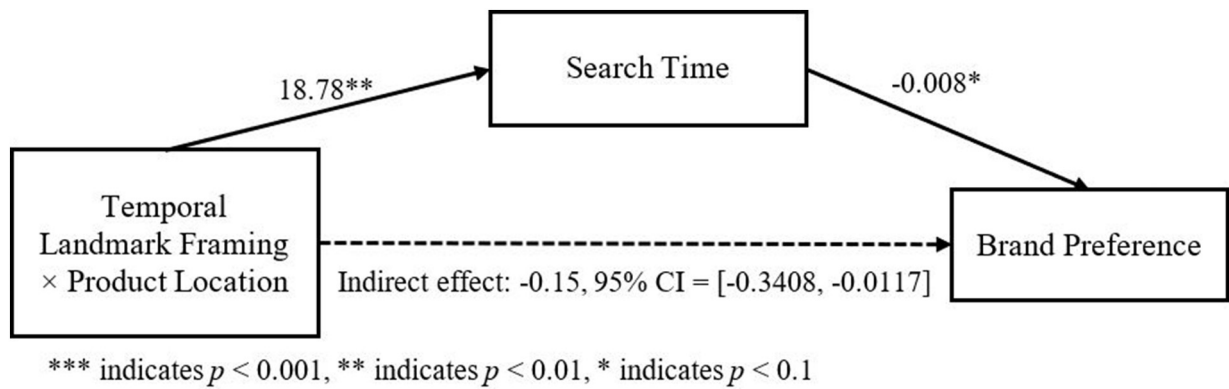


Fig. 2. Search time mediates the relationship between temporal landmark framing \times product location and brand preference index. *** indicates $p < 0.001$, ** indicates $p < 0.01$, * indicates $p < 0.1$.

advertisement (e.g., the left side or the right side), participants took less time to locate that product in the advertisement (a congruity effect). Moreover, this congruity effect influenced individuals' product attitudes and purchase intention. Importantly, we found that participants' actual search time mediated the relationship between temporal-spatial congruity and product attitudes and perceptions.

While study 2 incorporated an actual advertisement, one limitation was that in both study 2a and study 2b we used a product set (several products in an advertisement). Thus, we were interested in whether our effects hold for different consumption behaviors (gift giving versus product search and evaluation; study 3) and different environmental contexts (product appearing alone versus in a crowded environment; study 4). Study 3 was conducted in a natural, non-laboratory setting in the Fall of 2018 that required participants to choose a date they would like to send a gift they created to a friend. The manipulation required participants to create a "friendship card" that varied by the location of an existing illustration located on either the left or right side of the card. We suggest that when participants fill out the friendship card on the left side (because the illustration is on the right), they will prefer to send the gift on dates that represent the start of a time period, while those who fill out a friendship card on the right side (because the illustration is on the left), they will prefer to send the gift on dates that represent the end of a time period. Please see [Appendix E](#) for the actual cards used in the study.

6. Study 3

6.1. Participants and design

This study adopted a 2 (attentional focus: left versus right) \times 2 (temporal landmark framing: start versus end) between-subjects design. One hundred and ninety-six students from a large American university were randomly assigned to one of four conditions in the study. A booth was set up outside the entrance to a busy classroom building advertising the opportunity to participate in a "A Coffee Gift for Your Special Friend" event ostensibly sponsored by the university's business school. The cover story suggested that the event was designed to promote a warm and friendly campus culture, and that the university's Marketing department was providing an opportunity for students to send someone else a "friendship card" that included a free coffee refill. After agreeing to participate, participants were provided an index-sized card illustrated with two cartoon figures acting in a friendly way. We manipulated attentional focus by presenting the cartoon figures either on the right (left attentional focus condition) or left (right attentional focus condition; see [Appendix E](#)) side of the card. Participants were asked to write down a note to their friend on the card on the blank side of the card (opposite of the cartoon characters). Prior to study 3, we conducted a pretest ($n = 51$) to check whether our attentional focus manipulation was effective. In the pretest, participants filled out the same friendship card to be used in study 3, then reported where they focused their attention (1 = left side, 7 = right side). Results revealed that participants who filled out the left side of the friendship card focused more attention on the left side of the card ($M = 2.44$, $SD = 1.61$), while those who filled out the right side of the friendship card focused more attention on the right side of the card ($M = 5.39$, $SD = 1.50$; $F(1,49) = 45.77$, $p < .001$).

After completing their friendship card, participants were told that, in order to surprise their friend, the Marketing department would facilitate delivering the friendship card along with a free coffee refill on a date of the participant's choosing. Participants then viewed a list of six dates from October 24th, 2018 (Wednesday) to October 31st, 2018 (Wednesday). Following [Dai et al.'s \(2015\)](#) procedure, we manipulated temporal landmark framing by changing the descriptor of one of the dates: in the start temporal landmark framing condition, October 25th, 2018 was described as "Thursday, the FIRST DAY of winter, 2018", while in the end temporal landmark framing condition, October 25th, 2018 was described as "Thursday, the LAST Thursday of October 2018". We conducted a pretest prior to study 3 ($n = 62$) to test this manipulation by asking participants to rate either "October

25, 2018 (*Thursday, the FIRST DAY of winter, 2018*)” or “October 25, 2018 (*Thursday, the LAST Thursday of October 2018*)” on three items (1 = feels like a beginning, 7 = feels like an ending; 1 = feels like a common day, 7 = feels like a special day; 1 = feels like an ordinary day, 7 = feels like a meaningful day). We confirmed that framing October 25th as the first day of Winter felt more like a beginning to participants ($M = 3.48$, $SD = 1.63$) while framing October 25th as the last Thursday of October 2018 felt more like an ending to participants ($M = 4.74$, $SD = 1.24$; $F(1,60) = 11.71$, $p = .001$). However, participants felt both framings were similar in specialness and meaningfulness (specialness: $M_{start} = 2.26$, $SD = 1.63$, $M_{end} = 2.45$, $SD = 1.67$, $F(1,60) = 0.21$, $p = .65$; meaningfulness: $M_{start} = 2.16$, $SD = 1.34$, $M_{end} = 2.48$, $SD = 1.81$, $F(1, 60) = 0.64$, $p = .43$). After participants chose a date, they put the friendship card and coffee refill in an envelope and sealed the envelope. Finally, participants provided contact information for their friends so that their friends could be given their gifts. Participants were then debriefed and thanked.

6.2. Results

In study 3, our dependent measure was whether participants chose to send their gifts on October 25th, 2018. A logistic regression revealed significant main effects of both attention focus ($b = -3.10$, $\chi^2(1) = 9.01$, $p = .003$) and temporal landmark framing ($b = -4.03$, $\chi^2(1) = 11.49$, $p = .001$). More importantly, the interaction was significant ($b = 2.08$, $\chi^2(1) = 8.41$, $p = .004$). Specifically, when October 25th was framed as a start temporal landmark, participants were more likely to choose it when they focused on the left side of the friendship card (47.27%) compared to those focused on the right side of the friendship card (24.48%, $\chi^2(1) = 5.80$, $p = .02$). However, when October 25th was framed as an end temporal landmark, participants were marginally more likely to choose it when they focused on the right side (27.08%) than those focused on the left side (11.36%, $\chi^2(1) = 3.61$, $p = .06$; see Table 1).

6.3. Discussion

In study 3 we asked participants to make an actual decision about when to send a gift to their friend. By manipulating both temporal landmark framing and attentional focus, we found that participants reported increased preference for the target date (October 25th, 2018) when temporal landmark framing and attentional focus were congruent (versus incongruent). Thus, we find support for our proposed temporal-spatial congruity effect in both studies 2 and 3. More importantly, and different from study 2, study 3 adopted a “manipulation-of-mediation” design (Pirlott & Mackinnon, 2016; Spencer, Zanna, & Fong, 2005) allowing us to test the causal relationship between temporal landmark framing and attentional focus.

7. Study 4

The previous studies provided consistent results suggesting that when a temporal landmark is framed as the start (end) of a time period, consumers will focus more on the left (right) side of their visual-spatial environment, improving attitudes and increasing purchase intention toward products in that location. In study 4, we change the character of the visual-spatial environment by presenting a single product (a stainless-steel mug) in different orientations (e.g., the handle of the mug pointed either to the left or right). We predicted that when mug handle orientation matched the attentional focus shifted by temporal landmark framing, consumers would report more positive attitudes toward the mug.

7.1. Participants and design

Two hundred and sixty-seven registered Mturk users (53.6% females, $M_{age} = 34.26$) were recruited to take part in study 4 for monetary compensation. Study 4 was a 2 (temporal landmark framing: start versus end) \times 2 (mug handle orientation: left side versus right side) between-subjects design. Participants were randomly assigned to one of four conditions.

7.2. Procedure

We conducted study 4 on Monday, October 28th. Participants were first told that, because this study was to be conducted at different times during the week, we needed to record the actual day or date participants completed the study. In the start temporal landmark framing condition, we asked them what *day* it was today and provided seven options to choose from (i.e. Monday, Tuesday, etc., with the correct answer being Monday). In the end temporal landmark framing condition,

Table 1
Results in study 3.

		Temporal landmark	
		Start	End
Attention focus	Left	47.27%	11.36%
	Right	24.48%	27.08%

participants were instructed to record the *date* they were participating (today is XX of October, the correct answer being 28th). We then asked whether the participant thought today was the start or end of the time period as a manipulation check (1 = the start of a week/a month, 100 = the end of a week/a month). Next, participants viewed a webpage that presented a stainless-steel mug with the handle pointed either to the left (left mug handle orientation condition) or the right (right mug handle orientation condition) side of the screen (adapted from Elder & Krishna, 2012; see Appendix F). Participants were then asked to report their attitudes toward this mug (1 = not desirable/not attractive, 7 = very desirable/very attractive, $r = 0.809$, $p < .001$). After completing the attitude measure, participants were debriefed, thanked for their participation, and paid.

7.3. Results

We first conducted an independent *t*-test on whether participants viewed Monday, October 28th as either the start or the end of a time period across conditions. Results revealed that when the temporal landmark was framed as a Monday, participants were more likely to perceive it as a start ($M = 4.45$, $SD = 7.78$), while those who responded to the temporal landmark framed as October 28th were more likely to perceive it as an end point ($M = 94.69$, $SD = 3.32$, $t(265) = -122.15$, $p < .001$).

Next, we conducted a 2 (temporal landmark framing: start versus end) \times 2 (mug handle orientation: left side versus right side) ANOVA. Results indicated a significant interaction effect ($F(1,263) = 4.73$, $p = .031$). Specifically, participants reported more positive product attitudes when the mug handle was pointed to the left (left mug handle orientation) when framing October 28th as a start temporal landmark ($M = 4.75$, $SD = 1.32$) versus an end temporal landmark ($M = 4.30$, $SD = 1.56$, $F(1,263) = 3.44$, $p = .06$). However, participants did not differ in their product attitudes when the mug handle was pointed to the right (right mug handle orientation) across conditions ($M_{start} = 4.73$, $SD = 1.39$, $M_{end} = 5.06$, $SD = 1.42$, $F(1,263) = 1.78$, $p = .18$).

7.4. Discussion

Study 4 demonstrated that consumers reported more positive product attitudes toward products when the visual depiction of the product matched the temporal landmark framing. Specifically, participants reported more favorable attitudes toward a mug with the handle on the left side when the temporal landmark was framed as a start versus an end. However, positioning the mug handle to the right did not generate the same response. One possible reason is that although most participants perceived October 28th as an end of October, it is still not the last day of October. Thus, compared to the start temporal landmark condition, our manipulation of the end temporal landmark condition might not be strong enough. However, even in light of this limitation, we still found that participants reported more positive product attitudes toward the mug with the handle on the left compared to the right side.

8. General discussion

Our research examines the effect of temporal landmark framing on attentional focus and subsequent judgment and decision making. Across six studies, we find that people prefer products on the left side of a visual-spatial environment when a temporal landmark is framed as the start of a time period, but prefer products on the right side of a visual-spatial environment when a temporal landmark is framed as the end of that same time period. We find this relationship across both physical (e.g., pop-up store, study 1a) and virtual retail environments (e.g., an online shopping context, study 1b). Further, as a result of this temporal-spatial congruity, we find that participants remember more products in the visual-spatial environment congruent with their attentional focus (study 2a), spend less time searching for a target product located in an advertisement consistent with their shifted attentional focus (study 2b), and choose dates to deliver a gift to a friend consistent with their manipulated attentional focus (study 3). Finally, we find partial support for our temporal-spatial congruity effect when manipulating product orientation, rather than product location in an advertisement (study 4). Specifically, we find that participants report more favorable product attitudes and perceptions toward a product oriented to the left (right) side when a start (end) temporal landmark is made salient. Additionally, we observe these results using a subjective measure (product attitudes, study 4), an objective measure (product recall in study 2a, actual search time in study 2b), and behavioral measures (real choice in study 1a and study 1b, choosing a delivery date in study 3). Overall, these results reveal a heretofore unexplored effect of temporal landmark framing that across numerous research settings and measures, suggesting that our temporal-spatial congruity effect is robust and predictable.

8.1. Theoretical contribution

This research makes several contributions to the consumer behavior and psychology literatures. First, our research provides a new understanding of how temporal landmark framing influences individuals' attention focus and subsequent judgement and behavior. Prior temporal landmark research has investigated how temporal landmarks impact individuals' self-evaluation (Peez & Wilson, 2014), goal-pursuit (Dai et al., 2015), sense of resource availability (Kouchaki & Smith, 2013), and resource allocation (Zhu et al., 2018). However, these temporal landmarks differ markedly from those described in the current paper. In

previous research, temporal landmarks are described as either vivid public events that may or may not involve the self, significant personal events (e.g., birthdays, graduation), or calendar reference points. In our research, the type of temporal landmark is independent from its framing: the same point in time is merely framed as either the start or end of a time period, changing attentional focus.

Second, this paper outlines our novel temporal-spatial congruity effect, demonstrating that attentional shifts due to temporal landmark framing increases preferences for objects observed in that visual-spatial location. Previous research reported three different temporal-spatial congruity effects: short versus long duration (Vallesi et al., 2008), before versus after (Boroditsky et al., 2011), and past versus future (Chae & Hoegg, 2013). Adding to this previous research, we find that natural calendar points (e.g., October 28th) or significant consumption events (e.g., “end of summer sale”) framed as the start (end) of a time period shifts individuals’ visual attention to the left (right), resulting in congruity between the temporal landmark framing and attentional focus. When this congruity occurs, ease of processing increases, leading to more positive attitudes and preferences for objects located in the location of that congruity.

Finally, our research demonstrates a new antecedent of visual attention. Previous research has demonstrated how physical movements influence individuals’ visual attention, such as eye movement (Shen & Rao, 2016) or auditory stimulus (Shen & Sengupta, 2013). Our research identifies and explores a non-physical antecedent, temporal landmark framing, demonstrating how different temporal landmarks shift consumers’ visual attention. Thus, we identify and describe a connection between two distinct literatures: the temporal landmark and attentional focus literatures.

8.2. Managerial implications

Our research suggests a number of important managerial implications. First, firms often use points in time as a means to promote their products. Many firms attempt to do so through time-based promotions, such as Nordstrom’s “End-of-Year Sale” or Amazon’s “New Semester Sale”. Another strategy firms use is to join together to create pseudo-celebrations to arouse consumers’ passion for shopping, such as the “Black Friday Sale” in the United States or the “Single’s Day Sale” in China. Leveraging those well-established time-based promotion strategies, our findings suggest firms should frame these temporal landmarks differently depending on their specific situation. For example, if it were currently late August, marketing managers could frame this time period as either a “start of Autumn” sale or an “end of Summer” sale. Based on our findings, marketing managers should frame the time period as an “End of Summer” sale when products are presented or displayed on the right side of a visual-spatial environment (for example, an online retail website or in-store display), while a “Start of Autumn” sale should be more effective for products presented or displayed on the left side of that visual-spatial environment.

Second, how a company frames their delivery times can be an important factor in the customer buying process, potentially influencing customer satisfaction and repurchase intention. Especially for online retailers, where delivery is usually outsourced to professional shipping companies, customers are often informed of the expected delivery date of their purchases by the online retailer. Although the expected delivery date is not controlled by the retailer, retailers can change consumers’ attentional focus at checkout to match the expected delivery date. For example, retailers could locate the delivery date on the left side of screen if the delivery date happens to fall at the start of a time period (such as Monday or September 1st), but present the delivery date on the right side of the screen if the date falls at the end of that time period (such as Friday or September 30th). Our results suggest that this congruity should result in better attitudes toward the delivery date.

8.3. Future direction

A number of future directions are available for extending the current research. First, future research could better provide evidence of our temporal-spatial congruity effect using eye tracking. To the extent that temporal landmark framing shifts attention, we should see eye movement in the direction of the visual-spatial location primed by the temporal landmark. Second, while our effects were found in the USA which almost all Americans read and write from left to right. Future research should examine populations who read from right to left to see if the effect still holds or is reversed. Third, because we are interested in studying temporal landmarks that may be of managerial use to marketers, we chose to focus only on calendar-based temporal landmarks in the current paper. However, our findings might extend to previously studied temporal landmarks, such as vivid public events or significant personal events. Specifically, previous research has found that some significant personal events can be perceived as the start or an end of a time period (i.e. move to a new apartment or leave a city someone stayed for a long time; Dai et al., 2015). Future research should examine whether different types of temporal landmarks moderate the effects described here. In general, there are a number of exciting and interesting areas for this stream of research to focus on in the future.

Declaration of competing interest

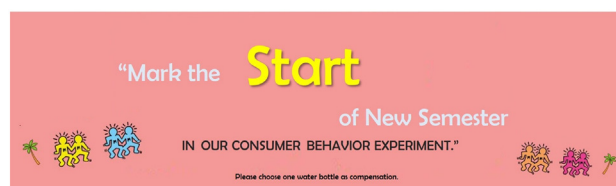
None.

Appendix A. Stimuli used in study 1a

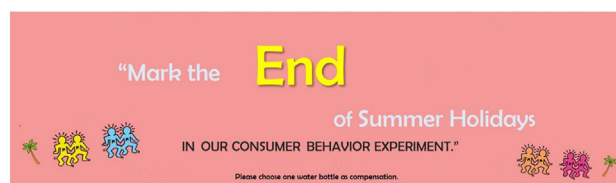
1) Pop-up store decoration



2) Temporal landmark manipulation in study 1a

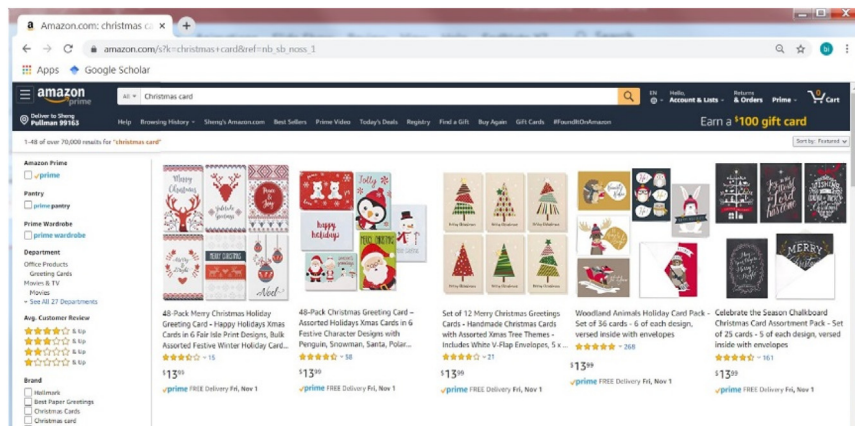


Start temporal landmark condition.

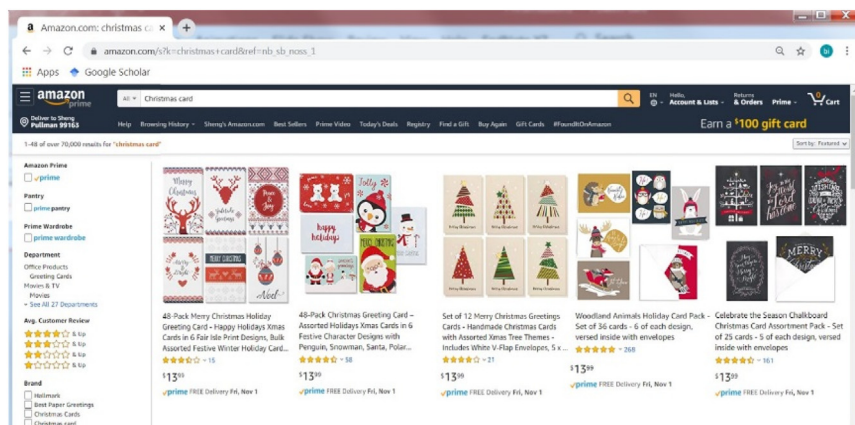


End temporal landmark condition.

Appendix B. Stimuli used in study 1b



Product array 1



Product array2

Appendix C. Products advertisement used in study 2a



Start temporal landmark condition



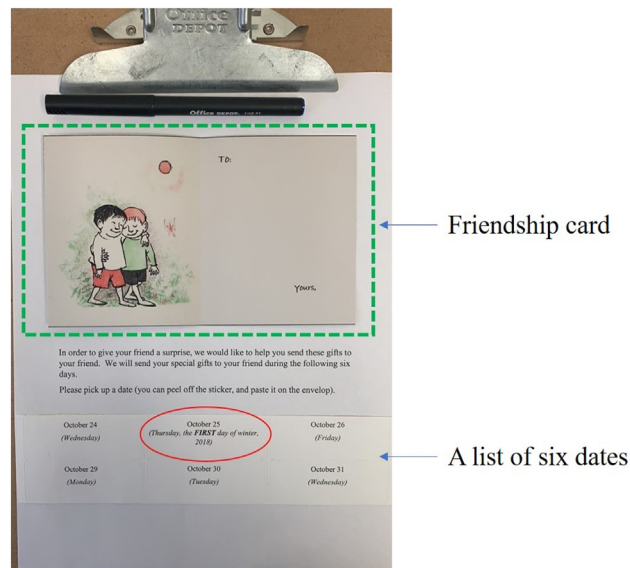
End temporal landmark condition

Appendix D. Products advertisement used in study 2b



Note: The target product (Becel margarine) is circled in red.

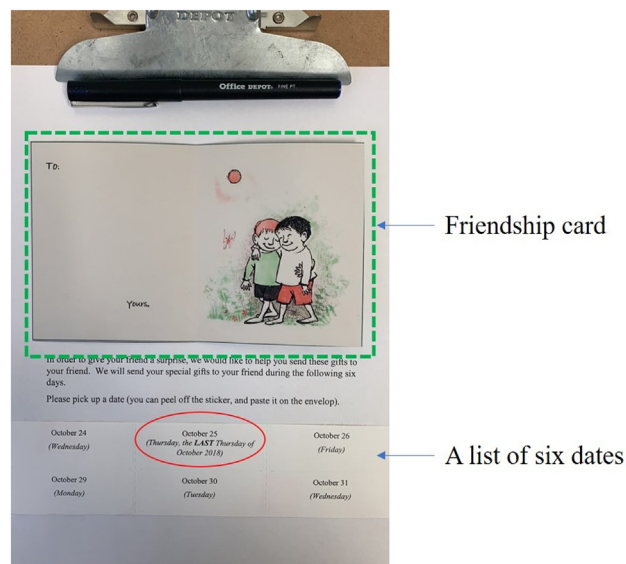
Appendix E. Stimuli used in study 3



Start temporal landmark and right focus condition

Note: In study 3, participants first fill out the friendship card, then choose a date they would like to send this gift to their friends. After that, they tear the date off (those dates are printed on adhesive labels), put the refill coffee card and friendship card in an envelope, and seal the envelope.

The date we manipulated as a start temporal landmark is circles in red.



End temporal landmark and left focus condition

Note: the date we manipulated as an end temporal landmark is circles in red.

Appendix F. Stimuli used in study 4



References

- Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition*, 75(1), 1–28.
- Boroditsky, L., Fuhrman, O., & McCormick, K. (2011). Do English and Mandarin speakers think about time differently? *Cognition*, 118(1), 123–129.
- Bottini, R., Crepaldi, D., Casasanto, D., Crollen, V., & Collignon, O. (2015). Space and time in the sighted and blind. *Cognition*, 141, 67–72.
- Chae, B., & Hoegg, J. (2013). The future looks “right”: Effects of the horizontal location of advertising images on product attitude. *Journal of Consumer Research*, 40(2), 223–238.
- Dai, H., Milkman, K. L., & Riis, J. (2014). The fresh start effect: Temporal landmarks motivate aspirational behavior. *Management Science*, 60(10), 2563–2582.
- Dai, H., Milkman, K. L., & Riis, J. (2015). Put your imperfections behind you: Temporal landmarks spur goal initiation when they signal new beginnings. *Psychological Science*, 26(12), 1927–1936.
- DeVoe, S. E., House, J., & Zhong, C. -B. (2013). Fast food and financial impatience: A socioecological approach. *Journal of Personality and Social Psychology*, 105(3), 476–494.
- Eikmeier, V., Alex-Ruf, S., Maienborn, C., & Ulrich, R. (2015). How strongly linked are mental time and space along the left–right axis? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 41(6), 1878–1883.
- Elder, R. S., & Krishna, A. (2012). The “visual depiction effect” in advertising: Facilitating embodied mental simulation through product orientation. *Journal of Consumer Research*, 38(6), 988–1003.
- Fitzsimons, G. M., Chartrand, T. L., & Fitzsimons, G. J. (2008). Automatic effects of brand exposure on motivated behavior: How apple makes you “think different”. *Journal of Consumer Research*, 35(1), 21–35.
- Fuhrman, O., & Boroditsky, L. (2010). Cross-cultural differences in mental representations of time: Evidence from an implicit nonlinguistic task. *Cognitive Science*, 34(8), 1430–1451.
- Gevers, W., Reynvoet, B., & Fias, W. (2003). The mental representation of ordinal sequences is spatially organized. *Cognition*, 87(3), 87–95.
- Gevers, W., Reynvoet, B., & Fias, W. (2004). The mental representation of ordinal sequences is spatially organised: Evidence from days of the week. *Cortex*, 40(1), 171–172.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Publications.
- Hennecke, M., & Converse, B. A. (2017). Next week, next month, next year: How perceived temporal boundaries affect initiation expectations. *Social Psychological and Personality Science*, 8(8), 918–926.
- Huang, X., Huang, Z., & Wyer, R. S. (2016). Slowing down in the good old days: The effect of nostalgia on consumer patience. *Journal of Consumer Research*, 43(3), 372–387.
- Hull, C. L. (1932). The goal-gradient hypothesis and maze learning. *Psychological Review*, 39(1), 25–43.
- Kivetz, R., Urminsky, O., & Zheng, Y. (2006). The goal-gradient hypothesis resurrected: Purchase acceleration, illusory goal progress, and customer retention. *Journal of Marketing Research*, 43(1), 39–58.
- Kouchaki, M., & Smith, I. H. (2013). The morning morality effect: The influence of time of day on unethical behavior. *Psychological Science*, 25, 95–102.
- Kubrat, M. A., Shevell, S. K., & Rips, L. J. (1998). A year’s memories: The calendar effect in autobiographical recall. *Memory & Cognition*, 26(3), 532–552.

- Labroo, A. A., Dhar, R., & Schwarz, N. (2007). Of frog wines and frowning watches: Semantic priming, perceptual fluency, and brand evaluation. *Journal of Consumer Research*, 34(6), 819–831.
- Lakoff, G., & Johnson, M. (1980). The metaphorical structure of the human conceptual system. *Cognitive Science*, 4(2), 195–208.
- Lee, A. Y., & Labroo, A. A. (2004). The effect of conceptual and perceptual fluency on brand evaluation. *Journal of Marketing Research*, 41(2), 151–165.
- Miles, L., Nind, L., & Macrae, C. (2010). Moving through time. *Psychological Science*, 21(2), 222–223.
- Novemsky, N., Dhar, R., Schwarz, N., & Simonson, I. (2007). Preference fluency in choice. *Journal of Marketing Research*, 44(3), 347–356.
- Ouellet, M., Santiago, J., Funes, M. J., & Lupiáñez, J. (2010). Thinking about the future moves attention to the right. *Journal of Experimental Psychology: Human Perception and Performance*, 36(1), 17–24.
- Peetz, J., & Epstude, K. (2016). Calendars matter: Temporal categories affect cognition about future time periods. *Social Cognition*, 34, 1–17.
- Peetz, J., & Wilson, A. E. (2013). The post-birthday world: Consequences of temporal landmarks for temporal self-appraisal and motivation. *Journal of Personality and Social Psychology*, 104(2), 249–266.
- Peetz, J., & Wilson, A. E. (2014). Marking time selective use of temporal landmarks as barriers between current and future selves. *Personality and Social Psychology Bulletin*, 40(1), 44–56.
- Pirlott, A. G., & Mackinnon, D. P. (2016). Design approaches to experimental mediation. *Journal of Experimental Social Psychology*, 66, 29–38.
- Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8(4), 364–382.
- Santiago, J., Román, A., Ouellet, M., Rodríguez, N., & Pérez-Azor, P. (2010). In hindsight, life flows from left to right. *Psychological Research*, 74(1), 59–70.
- Shen, H., & Rao, A. (2016). Looks good to me: How eye movements influence product evaluation. *Journal of Consumer Psychology*, 26(3), 435–440.
- Shen, H., & Sengupta, J. (2013). The crossmodal effect of attention on preferences: Facilitation versus impairment. *Journal of Consumer Research*, 40(5), 885–903.
- Shum, M. S. (1998). The role of temporal landmarks in autobiographical memory processes. *Psychological Bulletin*, 124(3), 423–442.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89(6), 845–851.
- Touré-Tillery, M., & Fishbach, A. (2015). It was (n't) me: Exercising restraint when choices appear self-diagnostic. *Journal of Personality and Social Psychology*, 109(6), 1117–1131.
- Ulrich, R., & Maienborn, C. (2010). Left–right coding of past and future in language: The mental timeline during sentence processing. *Cognition*, 117(2), 126–138.
- Vallesi, A., Arbula, S., & Bernardis, P. (2014). Functional dissociations in temporal preparation: Evidence from dual-task performance. *Cognition*, 130(2), 141–151.
- Vallesi, A., Binns, M. A., & Shallice, T. (2008). An effect of spatial–temporal association of response codes: Understanding the cognitive representations of time. *Cognition*, 107(2), 501–527.
- Weger, U. W., & Pratt, J. (2008). Time flies like an arrow: Space-time compatibility effects suggest the use of a mental timeline. *Psychonomic Bulletin & Review*, 15(2), 426–430.
- Zauberman, G., Levav, J., Diehl, K., & Bhargave, R. (2010). 1995 feels so close yet so far: The effect of event markers on subjective feelings of elapsed time. *Psychological Science*, 21(1), 133–139.
- Zhu, M., Bagchi, R., Hock, S. J., & Diehl, K. (2018). The mere deadline effect: Why more time might sabotage goal pursuit. *Journal of Consumer Research*, 45(5), 1068–1084.