

The Fresh Start Effect: Temporal Landmarks Motivate Aspirational Behavior

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ABSTRACT: The popularity of New Year's resolutions suggests that people are more likely to tackle their goals immediately following salient temporal landmarks. If true, this little-researched phenomenon has the potential to help people overcome important willpower problems that often limit goal attainment. Across three archival field studies, we provide evidence of a "fresh start effect." We show that Google searches for the term "diet" (Study 1), gym visits (Study 2), and commitments to pursue goals (Study 3) all increase following temporal landmarks (e.g., the outset of a new week, month, year, or semester; a birthday; a holiday). We propose that these landmarks demarcate the passage of time, creating many new mental accounting periods each year, which relegate past imperfections to a previous period, induce people to take a big-picture view of their lives, and thus motivate aspirational behaviors.

Key words: goals; motivation; temporal landmarks; mental accounting

1. Introduction

The beginning of the year is widely documented as a time when millions of people commit themselves with atypical vigor to achieving their goals, such as losing weight, eating more healthfully, quitting smoking, obtaining a better education, and saving more money (Marlatt, and Kaplan, 1972; Norcross, Mrykalo, and Blagys, 2002). The U.S. government actually lists popular New Year's resolutions on its official website and provides resources to help its citizens tackle their goals in the coming year (USA.gov, 2013). More broadly, the notion that fresh starts are possible and offer individuals an opportunity to improve themselves has long been endorsed by our culture. For example, Christians can be "born again," Catholic confessions and penance provide sinners with a fresh start, many religious groups engage in ritual purification or ablution ceremonies (e.g., Buddhists, Christians, Muslims, and Jews), and the

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metaphorical phoenix rising from the ashes is a ubiquitous symbol of rebirth. This suggests a widely shared belief that we have opportunities throughout our lives to start fresh with a clean slate, with the “New Year’s effect” representing just one example of a far broader phenomenon documented in this paper. Specifically, we show that special occasions and calendar events (e.g., a birthday, a holiday, the beginning of a new week/month), which demarcate the passage of time and create numerous “fresh start” opportunities at the beginning of new cycles throughout each year, are associated with subsequent increases in aspirational behavior.

Understanding when people are most motivated to pursue their aspirations is important for a number of reasons. Aspirational behaviors are activities that help people achieve their wishes and personal goals (Merriam-Webster.com, 2013). Examples of behaviors that people frequently aspire to engage in more often include exercising, saving money, studying, dating, and dieting (Khan, Dhar, and Wertenbroch, 2005). Notably, we often lack the self-control to expend the time and effort needed to achieve our aspirations and instead postpone the work necessary to tackle our goals until a later date (Bazerman, Tenbrunsel, and Wade-Benzoni, 1998; Milkman, Rogers, and Bazerman, 2008; O'Donoghue and Rabin, 1999). For example, individuals often repeatedly procrastinate when it comes to dieting, exercising, and quitting smoking. Over time, such near-sighted decision making can result in serious individual and societal problems, such as high rates of obesity and cancer.

Many researchers have sought to understand situational factors that motivate people to pursue their aspirations (e.g., Shiv and Fedorikhin, 1999; Botti et al., 2008; Sela, Berger, and Liu, 2009; Milkman, 2012; Toure-Tillery and Fishbach, 2012; Townsend and Liu, 2012). However, sparse research has investigated naturally-arising points in time when people feel particularly motivated to tackle their goals. Notable exceptions include past work demonstrating increased attention to aspirations at the outset of the New Year (Marlatt and Kaplan, 1972; Norcross et al., 2002) as well as unpublished (Cross, Peretz, Munoz-LaBoy, Lapp, Shelley, and Rosenfield, 2006; Fry and Neff, 2010) and concurrent studies (Ayers, Althouse, Johnson, and Cohen, 2013) suggesting that people are most likely to think about their health on Mondays.

This paper empirically examines whether other points in time, beyond (but including) the start of a new year or week, are associated with increases in aspirational behavior. Across three field studies, we demonstrate that people are more likely to pursue various types of aspirational behavior (e.g., dieting, exercising, goal pursuit) at the start of “new epochs” initiated by the incidence of temporal landmarks, including the beginning of a new week, month, year, and school semester, as well as immediately following a public holiday, a school break, or a birthday. We use historical Google search volume data, university gym attendance records, and data from the goal-setting website (www.stickK.com; hereafter referred to as stickK) to document this phenomenon, which we call “the fresh start effect.” Though much

past research assumes that self-control is a time-invariant trait (e.g., Shoda, Mischel, and Peake, 1990), we add to a growing body of recent research suggesting that self-control capacity is variable (Shiv and Fedhorkin, 1999; Khan and Dhar, 2006, 2007).

We postulate that temporal landmarks, including personally meaningful events (e.g., birthdays, job changes) and socially constructed calendar partitions (e.g., the outset of a new month, the observance of a public holiday), demarcate the passage of time and open new mental accounting periods. We propose two primary explanations for the fresh start effect. Specifically, we propose that naturally-arising time markers (a) create discontinuities in time perceptions that make people feel disconnected from their past imperfections (described in Section 2.2); and (b) disrupt people's focus on day-to-day minutiae, thereby promoting a big-picture view of life (described in Section 2.3). We postulate that these processes triggered by fresh start moments encourage people to pursue their aspirations. We will address and rule out a number of key alternative explanations for our findings, but it is important to acknowledge that our field data provide imperfect insights into the mechanisms responsible for the fresh start effect and thus additional future research on this topic would be extremely valuable.

2. Conceptual Framework

2.1. Temporal Landmarks Segregate Life into Numerous, Distinct Mental Accounting Periods

Past research on mental accounting has demonstrated that “choices are altered by the introduction of notional...boundaries” (Thaler, 1999, p.197) and has largely focused on examining how the initiation of new mental accounting periods affects financial outcomes (for reviews, see Read, Loewenstein, and Rabin, 1999; Thaler, 1999; Soman, 2004; Soman and Ahn, 2011). While this previous research has shown that time is not treated as continuous and fungible (Rajagopal and Rha, 2009; Soman, 2001), many implications of the non-linear way in which we experience time have not yet been explored. In this paper, we investigate how people's motivation to pursue personal goals can be altered by the initiation of new mental accounting periods, as demarcated by temporal landmarks.

Temporal landmarks, or distinct events that “stand in marked contrast to the seemingly unending stream of trivial and ordinary occurrences that happen to us everyday” (Shum, 1998, p.423), have been shown to structure our memories and experiences (Robinson, 1986; Shum, 1998). One type of temporal landmark includes reference points on socially constructed and shared timetables. Examples include the beginning of an academic semester, secular and religious holidays, and time dividers on the yearly calendar (Kurbat, Shevell, and Rips, 1998; Robinson, 1986). Another type of temporal landmark includes personally-relevant life events that demarcate our personal histories, such as developmental milestones, life transitions, first experiences, and occasions of recurrent significance (Robinson, 1986; Rubin and Kozin, 1984). These temporal landmarks not only influence the manner in which people recall memories, experiences, and time durations retrospectively (Ahn, Liu, and Soman, 2009; Rubin and Kozin, 1984;

Shum, 1998; Zauberman, Levav, Diehl, and Bhargave, 2010), but they are also used to organize current activities and future plans and to designate the boundaries of temporal periods (LeBoeuf, Williams, and Brenner, 2013; Peetz and Wilson, 2013; Robinson, 1986; Soster, Monga, and Bearden, 2010; Tu and Soman, 2013). For example, when asked to describe the periods into which they divide their time, people frequently list cycles such as a *day*, *week*, *month*, *school semester*, and *school break* (Soster et al., 2010). Furthermore, when a salient temporal landmark (e.g., a public holiday, a birthday, a school event) in between two points in time is highlighted, people are more likely to perceive those two points in time as arising in two distinct periods (Peetz and Wilson, 2013; Soster et al., 2010; Tu and Soman, 2013). Together, this research suggests that temporal landmarks open new mental accounts. We propose that when temporal landmarks open new mental accounts, the beginning of a new period stands in contrast to more typical days in our lives. Below, we describe two perspectives on why temporal landmarks may then motivate people to pursue their aspirations.

2.2. Temporal Landmarks Relegate Past Imperfections to a Previous Mental Accounting Period

Individuals think of their past, current, and future selves as interconnected but separable components of their identity (Parfit, 1984) and often compare these selves to one another (Wilson and Ross, 2001). For example, an individual might consider whether she is a wiser person now than she was in the past, or she might plan to be a better person in the future.

Past research has shown that the perceived connection between our present and past temporal selves can be affected by (a) personally-relevant events such as a religious conversion (Libby and Eibach, 2002, 2011; Wilson and Ross, 2003; Bartels and Rips, 2010) and (b) the salience of calendar landmarks (Peetz & Wilson, 2013). Anecdotally, past researchers have noted that people who change (e.g., receive a cancer diagnosis, recover from an addiction) often describe their pre-change self as a discrepant person (Libby and Eibach, 2002). Wilson and Ross (2003) suggest that many real-life experiences, ranging from personal milestones (e.g., a marriage or job change) to mundane changes in appearance or possessions (e.g., getting a new haircut or suit) can distance us from our past self. Together, this research demonstrates that landmarks in people's lives generate a disassociation between present and past selves.²

We propose that the psychological separation between one's present and past selves induced by temporal landmarks motivates people to pursue their aspirations. The theory of temporal self-appraisal contends that people evaluate their past self in a manner that flatters their current self (Wilson and Ross,

² Recent research has also shown that temporal landmarks affect the perceived psychological distance between people's present and *future* selves. Bartels and Rips (2010) demonstrated that the psychological connectedness between a person's present and future selves can be weakened by prompting them to imagine experiencing landmark events (e.g., finding out that they were adopted, being imprisoned as a political hostage). Also, recent work showed that highlighting a future landmark event (e.g., a public holiday, a birthday) induces a psychological separation between the current self and the post-landmark future self (Peetz and Wilson, 2013).

2001). In particular, people tend to disparage and attribute their past failures to their former, distant self because (a) faults of a remote, past self are less apt to tarnish their present self-image and thus are less threatening and (b) criticizing a distant, inferior self implies self-improvement over time, which is viewed as desirable (Wilson and Ross, 2001). Importantly, temporal landmarks – moments that psychologically disconnect one's past, current and future selves – lead people to perceive a contrast between their disconnected selves (Peetz and Wilson, 2013). This facilitates a tendency to view one's past self as inferior and one's current self as superior (Wilson and Ross, 2001).

We argue that by relegating previous imperfections to a past self and generating a sense that the current self is superior, temporal landmarks can alter people's decisions. Considerable past research has shown that people are motivated to maintain a coherent self-image (Epstein, 1973; Markus, Mullally, and Kitayama, 1997; Kivetz and Tyler, 2007). For example, if people perceive themselves as moral, they are more likely to pursue moral actions (Aquino and Reed, 2002). Thus, when people perceive themselves to be superior to a past self (e.g., more self-disciplined, more extroverted, etc.), past research suggests they will behave in accordance with those perceptions (e.g., study harder, become more active in social events, etc.). Therefore, we hypothesize that when temporal landmarks psychologically disconnect us from our inferior, past self and make us feel superior, we will be motivated to behave better than we have in the past and strive with enhanced fervor to achieve our aspirations.

It should be noted that some people may not see their past self as inferior to their current self. However, so long as the average person sees her past self as more flawed than her current self, the fresh start effect should emerge on average, albeit not necessarily for every individual.

2.3. Temporal Landmarks Promote a Focus on the Big Picture

In addition to psychologically separating people from their past imperfections, temporal landmarks may motivate people to pursue their aspirations by altering the manner in which they process information and form preferences. Specifically, by creating discontinuities in our perceptions of time, experiences, and activities, temporal landmarks may promote taking a broader view of decisions. Liu (2008) shows that interruptions to decision making (e.g., switching to a new background task while pondering a focal decision) change information processing. Specifically, interruptions move people from a bottom-up, contextually rich mode of thinking focused on concrete data to a higher level, top-down mode guided by pre-existing goal and knowledge structures. Temporal landmarks may serve as one type of disruption to decision making and thus direct attention to high-level, goal-relevant information. Indeed, there is some evidence that this is the case. For example, Bhargave and Miron-shatz (2012) show that people at milestone ages (e.g., 30, 40 years old) are more likely than those at other ages to judge their life satisfaction based on their overall achievements rather than their daily emotions, highlighting that temporal landmarks can lead to bigger picture thinking.

Past research has shown that high-level, big picture thinking has important implications for goal motivation. When induced to take a high-level view of a situation, people are more likely to evaluate their actions based on the desirability of the end state (or goal) they hope to achieve rather than the time and effort required to achieve it (Liu, 2008; Rogers and Bazerman, 2008; Trope and Liberman, 2003). As a result, high-level thinking leads people to make choices that are more oriented towards goal achievement (Liberman and Trope, 1998; Liu, 2008; Trope and Liberman, 2003). We therefore predict that when temporal landmarks serve as interruptions, leading people to take a higher-level, big picture view of their lives, people's motivation to achieve their aspirations will increase.

2.4. Hypothesis and Study Overview

Integrating the past literature described above, we propose that temporal landmarks (a) separate people from their past imperfections and (b) shift people to think at a higher level about their lives and decisions. Consequently, we hypothesize that people will exhibit an increased tendency to pursue their aspirations following temporal landmarks.

Across three field studies, we test the hypothesis that temporal landmarks motivate aspirational behaviors, but that these effects weaken as people perceive themselves to be further from a temporal landmark. Based on past research on landmarks in autobiographical memory, we know that the beginning of a generic calendar cycle (e.g., the beginning of a week, month, or year), the beginning of a new period on an academic or work calendar (e.g., the first month of a semester, the first workday after a meaningful holiday) and the beginning of a new period in one's personal history (e.g., immediately following a birthday) serve as salient temporal landmarks (Robinson, 1986; Soster et al., 2010). We therefore predict that aspirational behaviors will increase following these temporal landmarks.³ The aspirational behaviors we examine primarily involve the initiation of behaviors that contribute to achieving a goal and tend to require repeated effort (e.g., dieting, exercising). Specifically, Study 1 uses daily Google searches for the term "diet" to examine how public interest in one particularly common aspirational activity changes over time. Study 2 tests whether *actual* engagement in an aspirational behavior (exercise) increases following temporal landmarks using university gym attendance records. Study 3 investigates the frequency with which people commit to a broad set of goals on the goal-setting website, "stickK" (www.stickk.com). Our findings are consistent with the hypothesis that we propose based on the theories described above. Although the current research primarily focuses on illustrating an important phenomenon and does not provide a direct test of the underlying mechanisms, these three field studies rule out a number of uninteresting alternative explanations for our findings, which we will discuss in the sections below.

³ Note that we examine the impact of a set of temporal landmarks that past research has shown demarcate the transition to a new mental accounting period. However, we do not address precisely what types of temporal landmarks produce fresh starts and what types of temporal landmarks fail to do so in the current research. This is a question worthy of future investigation.

3. Study 1: Google Searches for “Diet”

In Study 1, we measure public interest in the adoption of one aspirational behavior at different points in time. Specifically, we explore whether Internet searches for the term “diet” by the general population increase following temporal landmarks. Maintaining a healthy diet is considered one of the most effective methods for maintaining an optimal body weight (Shai et al., 2008), and about two-thirds of adult Americans are currently classified as overweight or obese (Centers for Disease Control and Prevention, 2013), making dieting an important goal for most Americans. Indeed, dieting, losing weight, and eating more healthfully are among the most popular New Year’s resolutions listed on U.S. government’s website (USA.gov, 2013). As described above, we propose that temporal landmarks motivate the pursuit of aspirations by making an individual feel segregated from and superior to her past, imperfect self and by triggering her to take a big-picture view, which promotes a focus on goal attainment. Therefore, we predict that people will search for the term “diet” more frequently following temporal landmarks than on other days but that this increase will fade as the temporal landmark recedes into the past.

3.1. Data

We obtained data from “Google Insights for Search” (<http://www.google.com/insights/search>), a website where it is possible to download the daily number of Google web searches that include a given search term dating back to 2004. Daily data on a given search term can only be extracted in intervals of three months or less. We downloaded data on the daily number of Google searches in the United States for the term “diet” over three-month intervals ranging from January 1, 2004 to June 30, 2012 (a time period including 3,104 days). Daily search volume data provided by Google Insights for Search is both normalized relative to the total number of *daily* searches (for any and all terms) on Google and further scaled based on search activity for the specific query in question over the time period extracted (three months in this case). More specifically, the day in a downloaded extraction period with the highest number of searches (relative to total Google queries) is assigned a scaled value of 100, and other days receive values that are scaled accordingly to fall between 0 and 100.⁴ The relative daily search volume ranges from 19 to 100 during the study period ($M = 64$, $SD = 18$). See Electronic Companion Appendix A for Google’s description of this data.

3.2. Analysis Strategy

We examine whether people are more interested in dieting following temporal landmarks using ordinary least squares (OLS) regression analyses. Our regression models predict daily Google search volume for

⁴ Further, Google Insights for Search reports a search volume of “zero” when actual volume falls below a certain, undisclosed threshold. Zeros appear on seven days in our 3,104-day dataset. To ensure that these zero values did not spuriously magnify differences in search volume over time, we replaced each zero value with the lowest observed non-zero search frequency during the same extraction period. However, all reported results are robust to retaining zeros in our dataset.

the term “diet” as a function of a series of temporal landmark predictor variables described below. We estimate these regressions with fixed effects for the 34 three-month intervals in our data to account for the fact that search data is scaled within each interval and therefore cannot be compared directly over time. We also cluster standard errors at the three-month interval level.⁵

Because public holidays and the start of a new week, a new month, and a new year all represent partitions on the calendar, we expect that Internet searches for the term “diet” will be highest immediately following these temporal landmarks. Notably, individuals are naturally aware of the (continuously measured) day of the week (Monday-Sunday), day of the month (1-31), and month of the year (1-12), which means they are always aware of the time elapsed since the last temporal landmark corresponding to a new week, month or year. However, calendars do not track the number of days that have elapsed since the latest holiday. Thus, we do not expect people to be aware of how many days have elapsed since the last holiday they celebrated, but we do expect them to be aware of how far they are from weekly, monthly, and yearly fresh start moments on the calendar. In light of this, the predictor variables in our OLS regressions include measures of a given day’s distance from the beginning of the week, month, and year. However, when evaluating the fresh start effect associated with public holidays, we simply test whether searches for “diet” spike on the first workday after a holiday compared with other, mundane days. Specifically, we include the following predictor variables in our regression analyses to test for evidence of a fresh start effect:

- *Days since the start of the week.* We construct a continuous predictor variable indicating the days elapsed since the beginning of the current week (from 1 = Monday to 7 = Sunday).
- *Days since the start of the month.* We create a continuous predictor variable indicating the days elapsed since the beginning of the current month (min = 1, max = 31).
- *Months since the start of the year.* We include a continuous predictor variable indicating the number of months elapsed since the beginning of the current year (from 1 = January to 12 = December).⁶
- *First day after a Federal holiday.* We focus on the most widely celebrated U.S. holidays, or *Federal holidays*, which we define as one of the ten annual U.S. Federal holidays. We define the *first workday after a Federal holiday* as the first day when people return to work after a *Federal holiday* and include a dummy variable in our regressions to indicate whether or not a given day is the *first workday after a Federal holiday*.

⁵ Our results do not change qualitatively or in terms of statistical significance if standard errors are not clustered.

⁶ Because calendars count the time elapsed since the start of the year in months rather than days, we specified our regressions accordingly, but notably our results are robust to instead including a measure of the days elapsed since the start of the year.

- *First workday x Fresh start score of Federal holiday.* If, as hypothesized, temporal landmarks elicit fresh start feelings and increase aspirational behavior, we would expect search volume for the term “diet” to be particularly high on days that feel more like a fresh start. For a separate research project, we identified a list of 26 holidays, 10 of which were the Federal holidays studied here. We asked 52 participants on Amazon’s Mechanical Turk to rate the extent to which each of these 26 holidays (or the day after it) felt like a fresh start on a seven-point scale (1 = not at all; 7=very much) (see Electronic Companion Appendix B for these 26 holidays and the exact wording of our question). For the current study, we examine ratings of the 10 Federal holidays of interest. For each of these 10 holidays, we averaged participants’ ratings to form a composite fresh start score and standardized this score across the 10 holidays in our sample. We then created the variable *first workday x fresh start score of Federal holiday* by assigning the standardized rating of fresh start feelings associated with each Federal holiday to the first workday after a corresponding Federal holiday and assigning 0 to other days. Note that all reported results are robust to studying the set of 26 holidays rated instead of focusing only on the 10 Federal holidays.

3.3. Results

As predicted, we find that searches for the term “diet” are most frequent at the start of each new calendar cycle: the beginning of the week, month, and year (see Model 1 in Table 1). First, searches for the term “diet” are more common at the beginning of the week and decrease as the week proceeds, as indicated by a significant, negative coefficient on *days since the start of the week*. Further, the significant, negative coefficients on *days since the start of the month* and *months since the start of the year* indicate that search volume for the term “diet” decreases over the course of each month as well as each year.

As we hypothesized, there is also an increase in search volume for the term “diet” following Federal holidays (see Model 1 in Table 1). Consistent with our prediction that temporal landmarks stimulate increases in aspirational behavior, there are more searches for “diet” following Federal holidays perceived as more like a fresh start. Specifically, a one standard deviation increase in a Federal holiday’s fresh start rating is associated with a 6.78 point increase in daily search volume for the term “diet” (on a scale ranging from 0-100; $p < .001$, see Model 1 in Table 1).

Figure 1 illustrates that the magnitude of these effects is quite large when compared to the effect of the *New York Times* releasing a report on the successful clinical trial of an experimental diet pill in May, 2005 (see: www.nytimes.com/2005/05/11/business/11drug.html), a benchmark event that we expected to dramatically alter searches for the term “diet” (and which indeed increased “diet” search volume; $p < .001$). For example, the increase in daily search volume for the term “diet” associated with the start of the week (versus the end of the week) is about three times as large as the increase in search volume caused by this *New York Times* article.

Search Volume for Placebo Terms. It is important to highlight that search volume for the term “diet” is already scaled by Google Insights for Search to adjust for the total number of daily Google queries, so the detected relationships between daily searches for “diet” and temporal landmarks cannot be attributed to changes in Internet search volume. However, to further exclude the possibility that our findings in Study 1 can be attributed to general patterns of Internet search over time, we compare searches for the term “diet” with searches for two popular search terms: “news” and “weather” (e.g., “news” was on Google’s list of “hot searches” in the United States on July 23rd, 2012), which do not relate to aspirational behaviors. Furthermore, to empirically address two alternative explanations that may account for our findings in this paper (discussed in detail in our General Discussion), we identified and analyzed two additional placebo terms: “laundry” and “gardening.”⁷ We download daily search volume for these four terms during the same period when searches for the term “diet” are analyzed (from January 1, 2004 to June 30, 2012). When we re-run our models with the aforementioned placebo terms (news, weather, laundry, and gardening), we neither predict nor find that searches for these terms systematically increase following the temporal landmarks examined in Model 1 (see Models 2-5 in Table 1).^{8,9}

3.4. Discussion

The findings presented in Study 1 support our hypothesis that public interest in one important aspirational behavior – dieting – is higher following temporal landmarks. Specifically, we find that relative to baseline (Model 1 in Table 1), interest in dieting increases at the start of a new week (by 14.4%), a new month (by 3.7%), and a new year (by 82.1%), and following Federal holidays (by 10.2%). The effects cannot be attributed to general patterns of Internet traffic since the data we analyze is already scaled to account for overall search traffic on a given day and the search volume for other popular terms (news, gardening and weather) does not exhibit the same systematic patterns.

Study 1 examines people’s tendency to search for information about one particularly common aspirational behavior. However, we predict that the fresh start effect alters not only searches for information, but also actual decisions, as motivations and intentions are the first steps toward initiating

⁷ See the General Discussion section for details about the two alternative accounts as well as how we identified these placebo terms.

⁸ The coefficient on *days since the start of the week* is a negative and significant predictor of daily searches for “news.” A closer examination reveals that the negative coefficient on *days since the start of the week*, however, is driven by a dramatic drop in “news” search volume on weekends compared with weekdays, rather than by a gradual decline over the course of a week as is the case with searches for “diet” (and as the fresh start hypothesis predicts). In fact, people are significantly more likely to search for “news” on each day from Tuesday to Friday relative to Monday, while people are more interested in dieting on Mondays than on all other days of the week (all p ’s < 0.001; see Models A1- A2 in Electronic Companion Appendix C).

⁹ Across our regressions with these four placebo terms, a few coefficient estimates are statistically significant in the predicted “fresh start” direction, while others show significant effects in the opposite direction. Consistent with our hypothesis, we did not observe reliable increases following temporal landmarks in searches for any of these placebo terms – only for the term “diet”.

actions and are predictive of behaviors (Ajzen, 1991; Gollwitzer, 1999). Our next study examines this prediction.

4. Study 2: Undergraduate Gym Attendance

By creating a discontinuity in our time perceptions and experiences, temporal landmarks can both psychologically separate individuals from their past imperfections and promote high-level thinking. Such processes are predicted to spur people to pursue aspirational behaviors following temporal landmarks. This is a hypothesis that we test in Study 2 by examining the frequency of engagement in one important aspirational behavior – exercise. Increasing the frequency of exercise is one of the three most popular New Year’s resolutions (Norcross et al., 2002; Schwarz, 1997). Like dieting, regular physical activity helps with weight loss and weight maintenance (Catenacci and Wyatt, 2007). However, only about 50% of American adults exercise as often as recommended by government guidelines (“U.S. Physical Activity Statistics,” 2007). Thus, for many, exercise is an important but difficult-to-engage-in aspirational behavior.

In addition to examining actual engagement in an aspirational behavior (exercise), Study 2 also explores an additional, important predictor variable that was not available in Study 1. Specifically, in Study 2, we are able to investigate the impact on exercise of both calendar markers (e.g., holidays, the start of a new week, month or year) and one type of *personal* temporal landmark: birthdays.

4.1. Data

We obtained historical, daily gym attendance data for every undergraduate member ($N_{members} = 11,912$) of a fitness center affiliated with a large university in the northeastern United States from September 1, 2010 through December 9, 2011 ($N_{days} = 442$).¹⁰ Attendance was recorded automatically when students presented a magnetic student identification card to enter this facility. We also obtained information about the birthdates of a subset of these undergraduate members ($N_{members_with_birthday_data} = 2,076$). The number of students visiting the gym per day ranged from 31 to 2,270 during the study period ($M = 883$, $SD = 470$).

4.2. Analysis Strategy

We conduct two types of OLS regressions to analyze our gym attendance data. The first aggregates attendance records across all undergraduate gym members on a daily basis. The outcome variable in this regression specification is the total number of gym visits on a given day divided by the number of hours the gym was open on that day (or the average gym visits per hour), which ranged from 5 to 142 ($M = 54$, $SD = 27$) in our sample. Our second analysis examines the likelihood that a given gym member visits the gym on each day in our dataset using an OLS regression model including fixed effects for each gym

¹⁰ During this period, the gym was closed on 19 days. No observations about these days were therefore included in the raw dataset that the fitness center shared with us, and we thus exclude them from our analysis.

member and clustering standard errors at the date level.¹¹ The inclusion of gym member fixed effects controls for the effects of individual differences in time-invariant characteristics (e.g., gender, race, birth month) on gym attendance. To conduct this second analysis, we create a data set that contains one observation for each gym member on each day ($N_{person-days} = 5,265,104$). The dependent variable in this analysis equals one if a given gym member visited the gym on a given day and equals zero otherwise. In both of our regression specifications, we include predictor variables capturing the relationship between a given calendar day and temporal landmarks, as described below.

We predict that students will be more likely to visit the gym immediately following calendar landmarks and that their attendance will decline as these time markers become less salient. As in Study 1, we include *days since the start of the week*, *days since the start of the month*, and *months since the start of the year* as predictor variables in our regressions. However, unlike in Study 1, we do not expect Federal holidays to be particularly salient calendar markers in the Study 2 student population because the university whose fitness center provided data for our study only closes for a subset of public holidays and has its own break schedule during the academic cycle. Thus, we expect the set of holidays and breaks recognized by this university to be more relevant landmarks than Federal holidays for our study population. As explained in Study 1, people do not naturally track the number of days elapsed since a recent holiday, so we measure the effects of holidays by creating a dummy predictor variable to indicate whether or not a day is the first day after any of the breaks listed on the university's academic calendar.

In addition, we expect the start of a new academic semester and birthdays to be meaningful partitioning points in the lives of the students included in our gym dataset. We predict that gym attendance will be highest immediately following the outset of a new semester and following an individual's birthday and will decline as the new semester or year of life proceeds. We include the following predictor variables in our regression analyses to test these hypotheses:

- *Months since the start of the semester.* We include a continuous predictor variable indicating the months elapsed since the beginning of the current semester (e.g., 1 = September or January; 4 = December or April).
- *Months since last birthday.* We were able to obtain information about the birthdates of a subset of 2,076 gym members, which we matched with their gym attendance records. We define a *birth year* as a personalized year that starts on the first day following an individual's birthday and ends on his or her next birthday. For each of the 2,076 students in our dataset with a known birthday,

¹¹ We use an ordinary least squares regression model (rather than a more computationally intensive logistic regression model) because we include a large number of fixed effects and because logistic regression models typically produce inconsistent estimates when fixed effects are included unless data characteristics meet a stringent set of assumptions (Wooldridge, 2010). However, we obtain qualitatively similar results when we re-run our analyses using logistic regression models, though the significance of some predictors changes.

we include a continuous predictor variable in our regressions indicating the months elapsed since their last birthday. Specifically, we calculate the distance in days between each date in the study period and a given student's previous birthday. We convert this distance to units of months with each "month" taking on the actual length of the appropriate calendar month (e.g., 1 = the 31 days immediately following an individual's birthday; 12 = the 31 days immediately preceding an individual's birthday, including the birthday itself).

We control for a number of other variables that may affect a student's likelihood of attending the gym. Since college students are likely to be away from campus during school breaks, we create one dummy variable to indicate whether the university studied was in normal class session (fall and spring semesters, excluding school breaks) and another dummy variable to indicate whether the university was in summer session on a given date. Furthermore, since exam periods occur at the end of the semester and the calendar year, it is possible that *month of the year* and *month of the semester* affect gym attendance because students are busier than usual or more likely to have left school during exams. To alleviate this concern, we control for whether each date fell during the university's final exam period. To account for the fact that more students leave campus as the exam period progresses, we also include a variable in our regressions to indicate the number of days since the start of the final exam period, which is coded as zero for dates falling outside of the university's final exam period. All reported results are also robust to excluding days falling during exam periods from our data analysis. For the analyses at the level of the individual gym member, we also control for the number of hours that the gym was in operation on a given calendar date.

4.3. Results

Models 6-8 in Table 2 present results from OLS regressions exploring the statistical relationship between temporal landmarks and (a) average gym visits per hour across all gym members (Model 6) and (b) daily gym attendance by individual members (Models 7 and 8).

First, as we observed with searches for the term "diet," we find that gym attendance increases at the start of each new week, month, and year. As Models 6 and 7 in Table 2 show, *days since the start of the week* takes on a significant, negative coefficient, indicating that people visit the gym less as each week proceeds.¹² Further, the significant, negative coefficients on *days since the start of the month* and *months since the start of the year* in Models 6 and 7 suggest that gym attendance decreases over the course of each month as well as each year.¹³ In addition, as hypothesized, Models 6 and 7 show that students

¹² In separate regressions where we replace days since the start of the week with six indicator variables – one for each day of the week from Tuesday to Sunday (with Monday omitted) – we find that hourly gym traffic is higher on Mondays than on all other days (all p 's < 0.05 except the comparison with Tuesday; see Models A6-A8 in Electronic Companion Appendix D).

¹³ It is worth noting that students in our study do not pay to use the gym: all enrolled undergraduates are automatically granted memberships at the university's fitness facility. Therefore, the observed decrease in usage over the course of a given month or

exercise more both at the start of a new semester (relative to the end of the semester)¹⁴ and on the first day after a school break.

For the subset of 2,706 gym members whose birthdates were made available to us, we explore whether the likelihood that a student visits the gym is higher in the weeks and months immediately following a birthday than later in the year. In an initial regression analyzing daily gym attendance in this sub-population, we actually observe a positive correlation between the variable *months since birthday* and gym attendance ($\beta = 3.6 \times 10^{-4}$, $p < 0.0001$) – the opposite of our prediction. However, when we examine this relationship more closely, we find that gym members react dramatically differently to their 21st birthdays than to other birthdays. Specifically, students turning 21 tend to decrease their gym attendance following this birthday. However, for students celebrating other birthdays, we observe the predicted, significant and negative correlation between *months since birthday* and gym attendance (see Model 8 in Table 2). This indicates that students exercise more frequently right after most birthdays. The 21st birthday exception may be related to the fact that this birthday corresponds to the date when students are first legally permitted to purchase alcoholic beverages or to the fact that it is associated with an increase in autonomy and social status, which may reduce students' urges to change themselves for the better. Of course, while it is interesting that the 21st birthday is qualitatively different from other birthdays, it is important to highlight that potential explanations are entirely speculative.

To confirm that the 21st birthday differs significantly from other birthdays with respect to the predicted fresh start effect, we ran a regression including observations of all students with available birthdate data to predict whether each student visited the gym on each date in our dataset. We added a dummy variable (*age 21*) to indicate whether an observation corresponded to a day in the year following a gym member's 21st birthday and interacted this dummy variable with all other predictor variables in our model (including control variables and person fixed effects). The interaction between *months since birthday* and *age 21* is significant and positive in this model ($\beta = 7.9 \times 10^{-4}$, $p < 0.05$), which means that the coefficient on *months since birthday* for observations associated with all birthdays other than the 21st is significantly larger than the coefficient for observations associated with students' 21st birthdays.¹³ Because we are interested in the effect of birthdays on gym attendance at a typical age, we report the results from analyses of all other birthdays in Table 2 (see Model 8). In a regression where we replace *months since birthday* with 11 dummy variables to indicate each month in a person's birth year (with the half-birthday month marker as the omitted reference month), we find that people are more likely to

semester could not be attributed to gradually decreasing sensitivity to membership payments as described by Gourville and Soman (1998).

¹⁴ Importantly, the finding that gym attendance decreases over the course of a semester, though consistent with our proposed fresh start effect, may be driven by the fact that students become busier as the semester proceeds. However, other temporal landmarks examined in this study could not be explained by this alternative account.

exercise during the first month after a birthday than during the half-birthday month ($\beta = 2.9 \times 10^{-3}$, $p < 0.05$), and they are also less likely to exercise during the final month preceding a birthday ($\beta = -3.4 \times 10^{-3}$, $p < 0.05$). We conclude that birthday temporal landmarks typically motivate exercise, and motivation declines over the course the year, reaching its lowest level in the final month preceding a birthday.

Figure 2 illustrates the magnitude of these effects. Specifically, these effects are compared to the impact of extending the gym's hours of operation by one hour (which itself is a significant, positive predictor of attendance; $p < 0.001$). We observe that the effects of temporal landmarks on gym attendance are quite large in comparison with the effect associated with extended hours. For example, the increase in an individual's probability of going to the gym in the month immediately following a birthday (versus the month immediately preceding a birthday) is equivalent to the effect associated with keeping the gym open for two extra hours.

4.4 Discussion

Study 2 shows that people are more likely to exercise following temporal landmarks: the probability of visiting the gym increases at the beginning of a new week (by 33.4%), month (by 14.4%), year (by 11.6%), and semester (by 47.1%), as well as following school breaks (by 24.3%), relative to baseline (Model 7 in Table 2). In addition to replicating the findings of Study 1 with a consequential behavioral outcome, Study 2 also demonstrates that personally-relevant temporal landmarks – namely, birthdays – are, like calendar landmarks, associated with subsequent upticks in aspirational behavior. In this case, the probability of visiting the gym is increased by 7.5% following birthdays besides the 21st (Model 8 in Table 2).

One alternative explanation for some of our findings in Studies 1 and 2 is that people consume a larger amount of food on certain temporal landmarks, such as holidays and weekends. As a result, people might try to reduce their caloric intake or exercise more intensively following these “binges” in an attempt to lose weight gained leading up to temporal landmarks. This alternative account suggests that the tendency to start healthier routines following temporal landmarks is simply a *physiological* response to the health effects of overindulgence. In light of the concern that some Federal holidays are excuses for gluttony, we conducted robustness checks by removing Independence Day, Labor Day, Thanksgiving Day, and Christmas from the list of public holidays and school breaks included in our regression analyses. We found that daily Google searches for the term “diet,” average gym visits per hour, as well as the probability of visiting the gym are still significantly higher on the first workday after a Federal holiday or a school break than on typical days. In spite of this alternative explanation's inability to account for all of our empirical findings in Studies 1 and 2, to more carefully address the possibility that the fresh start effect is exclusively the product of overeating on weekends and holidays, we conduct an additional study.

5. Study 3: Commitment Contracts

The objective of Study 3 is to demonstrate that following temporal landmarks, people take steps to tackle a broad set of goals that they aspire to achieve, and increases in the intensity of goal pursuit cannot be explained by the physiological alternative explanation articulated above. We expect temporal landmarks to propel the pursuit of a broad set of goals because temporal landmarks, by demarcating new mental accounting periods, can both psychologically distance the current self from past imperfections and direct an individual to focus on high-level, goal-relevant ambitions.

5.1. Data

We obtained data from stickK (www.stickK.com), a website that helps customers achieve their personal goals. Specifically, stickK offers users an opportunity to set personal goals and specify consequences that will ensue if they fail to achieve those goals. It is well-documented that goal-setting establishes reference points (e.g., Heath, Larrick, and Wu, 1999; Sackett, Wu, White, and Markel, 2013) and is instrumental to goal achievement (Locke and Latham, 1990). To create what stickK terms a “commitment contract,” users first specify their goal and select a date by which they contractually agree to accomplish it. Next, users choose an amount of money to forego if they fail to achieve their goal. When users put a positive amount of money on the line, they also select a recipient of these stakes (e.g., a friend, a charity), should they fail to achieve their goal. Finally, users have the option to (a) designate a third party to monitor and verify their achievements and (b) designate other stickK users as their supporters. When creating a commitment contract, users can choose one of stickK’s five standard goals (*exercise regularly, lose weight, maintain weight, quit smoking, or run a race*) or specify a *custom goal*, which they are asked to classify into one or more of the following categories: career, diet and healthy eating, education and knowledge, exercise, family and relationships, green initiatives, health and lifestyle, home improvement, money and finance, personal relationships, quit smoking, religion, hobbies and recreation, and weight loss.

The data that stickK provided for this study contains 66,062 records of commitment contracts that 43,012 unique users created between October 1, 2010 and February 13, 2013 ($N_{days} = 886$). Table 3 lists summary statistics for the number of contracts created per day in each goal category.

5.2. Analysis Strategy

We conduct two types of analyses with data from stickK. The first aggregates commitment contracts across all users on a daily basis ($N_{contracts} = 66,062$, $N_{users} = 43,012$, $N_{days} = 866$) and relies on OLS regression models to predict the total number of contracts created each day. The second method allows us to examine the motivating effects of birthdays by examining the likelihood that a given user creates a goal on each day in our dataset using an OLS regression model including fixed effects for each of 42,913 users whose birthdates were made available to us. We cluster standard errors at the date level. As in Study 2, we create a data set that contains one observation per user per day ($N_{person-days} = 37,162,658$). We set the

dependent variable in this person-day analysis equal to one if a given stickK user created a commitment contract on a given day and zero otherwise.

As in Studies 1 and 2, we create a set of predictor variables indicating a given calendar day's proximity to the beginning of the week (*days since the start of the week*), the beginning of the month (*days since the start of the month*), and the beginning of the year (*months since the start of the year*). Using the same methods described in Section 3.2, we construct (a) the dummy variable, *first workday after a Federal holiday*, to indicate whether a given day is the first workday after a Federal holiday, and (b) the variable *first workday x fresh start score of Federal holiday*, to indicate the extent to which each Federal holiday was rated as a fresh start. We again expect that birthdays represent important personal temporal landmarks and therefore promote a focus on aspirations. For the subset of 42,913 stickK users whose birthdates were available to us, we create the additional predictor variable *months since last birthday* using the method described in Section 4.2 ($N_{contracts} = 65,845$).

We control for stickK's considerable growth in users and contracts during our study period. For each calendar day in our dataset, we create a control variable, *days since launch*, to indicate the number of days elapsed since the start of our dataset. We also include its quadratic term to control for the potentially non-linear trend in the growth of the stickK customer population.¹⁵

5.3. Results

5.3.1. All Types of Commitment Contracts. Consistent with our hypothesis, we find that goal contracts are created more frequently at the beginning of the week than at the end of the week, as indicated by a significant, negative coefficient on *days since the start of the week* in our regression models (see Models 9 and 10 in Table 4).¹⁶ Also, the significant, negative coefficients on *days since the start of the month* and *months since the start of the year* in Models 9 and 10 in Table 4 indicate that people create more new goals at the beginning of the month and year as compared with the end of the month and year. Further, as we hypothesized, the total number of commitment contracts increases immediately following Federal holidays, and the magnitude of this increase is larger after holidays rated as more likely to elicit fresh start feelings (see Models 9 and 10 in Table 4).

We next turn to an exploration of whether the likelihood that a user creates a contract is higher in the weeks and months immediately following his or her birthday compared with later in the year. For the 42,913 users in our dataset with a known birthdate, the variable *months since birthday* is a negative and

¹⁵ Our independent variables of interests remained qualitatively the same in terms of magnitude and statistical significance if we excluded the quadratic term from our regression models.

¹⁶ In a separate regression where we replace *days since the start of the week* with six indicator variables – one for each day of the week from Tuesday to Sunday (with Monday omitted) – we find that the number of commitment contracts created is significantly higher on Mondays than on any other day of the week (all p 's < 0.05 except the comparison with Tuesday; see Models A9 and A10 in Electronic Companion Appendix E).

marginally significant predictor of the likelihood that a user will create a goal contract on a given day (see Model 10 in Table 4). This suggests that people are more motivated to pursue goals following a birthday than preceding one.¹⁷ In a regression where we replace *months since birthday* with 11 dummy variables to indicate each month in a person's birth year (with the half-birthday month marker as the omitted reference month), we find that people are significantly more likely to create a commitment contract during the first month after a birthday than during the month of their half-birthday ($\beta = 7.0 \times 10^{-5}$, $p < 0.05$), and they also show an (insignificant) trend of creating fewer commitment contracts in the last month before their birthday relative to their half-birthday month ($\beta = -3.4 \times 10^{-5}$, $p > 0.10$).

Figure 3 illustrates that the magnitude of these effects is quite large in comparison with the impact of *ABC News* releasing a feature article about stickK in March, 2012 (see: <http://abcnews.go.com/Business/stickk-websites-pay-cash-meet-goals/story?id=15904736#.UbISLJwV85J>), a benchmark event that we would expect to dramatically increase attention to stickK (indeed, this article significantly increased the number of contracts created on the day of its release; $p < 0.05$). For example, the increase in an individual's probability of creating a contract right after a Federal holiday (relative to other more mundane days) is four times as large as the effect of the release of this *ABC News* article.

5.3.2. Commitment Contracts for Custom Goals. It is important to address the possibility that some of our findings in Studies 1 and 2 could be driven by over-indulgence associated with certain types of temporal landmarks (e.g. holidays, weekends, birthdays), which might lead to subsequent compensatory exercising and dieting. To address this possibility, we investigate the patterns described above in Section 5.3.1 for *custom goals* that are not health-related. As described above, when creating a custom goal, stickK provides a list of goal sub-categories and requires users to check all sub-categories that apply. The list of sub-categories encompasses a broad set of domains, including many that are not directly related to health (specifically, these include: career, education and knowledge, money and finance, personal relationships, green initiatives, home improvement, religion, family and relationships, as well as hobbies and recreation). Examples of health-irrelevant custom goals that are featured on [www.stickK.com](http://www.stickk.com) include “being on time”, “spending more time with family”, “helping others”, “learning something new”, and “reducing debt” (<http://www.stickk.com>, July 28, 2013). To ensure that the fresh start effect is not simply the result of compensatory cutbacks following overindulgence, we focus on *custom goals* for which stickK users did not select any health-related sub-categories ($N_{contracts} = 15,213$, $N_{days} = 866$, $N_{users} =$

¹⁷ Note that we do not expect the 21st birthday to differ from other birthdays (and do not find that it differs) when it comes to general goal setting. The legal option to purchase alcohol may alter one's immediate inclination to exercise (Study 2) but it should not affect one's general inclination to set goals (Study 3).

10,074). Using the same OLS regression model specifications described in Section 5.2, we predict the total number of contracts created each day for health-irrelevant custom goals.

As predicted, health-irrelevant custom goal contracts (see Table 4, Models 11 and 12) are created more frequently at the beginning of the week, month, and year, following Federal holidays, and particularly after holidays rated as more like a fresh start, compared with other days. Although there is a trend whereby more health-irrelevant custom goals are initiated following a birthday, this trend is not significant (see Table 4, Model 12). Models 13-15 in Table 5 report regression results for the three most popular health-irrelevant custom goals (career, education and knowledge, and money and finance), which all show these same trends.

5.3.3. Robustness Across Goal Types. We find the same basic patterns of results when we separately analyze health-relevant custom goals as well as the five types of standard goal contracts offered by stickK: *exercise regularly, lose weight, maintain weight, quit smoking, run a race*. See Models 16-21 in Table 5 for regression results broken down by goal type.

5.4. Discussion

Consistent with our hypothesis, Study 3 shows that relative to baseline, people are more likely to commit to their goals at the beginning of a new week (by 62.9%), month (by 23.6%), or year (by 145.3%), and following Federal holidays (by 55.1%), as well as following their birthdays (by 2.6%) (Model 10 in Table 4). Further, Study 3 provides evidence that the fresh start effect pertains to a broad set of health-irrelevant goals (e.g., career, education and knowledge, and personal relationships). This suggests that the increase in aspirational behaviors following temporal landmarks that we document throughout this paper cannot be parsimoniously explained by the physiological need to offset overindulgence.

6. General Discussion

Across three field studies, we find evidence of a fresh start effect whereby people exhibit a higher likelihood of engaging in aspirational behaviors following temporal landmarks such as the initiation of new calendar cycles (e.g., the start of a new week, month, year, or academic semester), holidays, and birthdays. We analyze a broad set of aspirational activities: web searches for the term “diet”, gym attendance, and the creation of commitment contracts to support a wide range of different goals. The effects we document are large in magnitude, suggesting that the fresh start effect has meaningful implications for individual and societal welfare.

The fresh start effect documented in this paper is consistent with two psychological processes we proposed to parsimoniously explain it. First, new mental accounting periods as demarcated by temporal landmarks psychologically distance the current self from past imperfections, propelling people to behave in line with their new, positive self-image. Second, temporal landmarks interrupt attention to day to day minutiae, causing people to take a big-picture view of their lives and thus focus more on achieving their

goals. This paper relies on field data to demonstrate the existence of the fresh start effect, but it does not offer a direct test of the underlying mechanisms responsible for this effect. Thus, future research documenting the psychological processes that underlie the fresh start effect would be extremely valuable. In the next section, we discuss and provide evidence that helps rule out a number of uninteresting alternative explanations for our findings.

6.1. Alternative Explanations

One concern with our findings is that people tend to engage in activities prior to (or during) temporal landmarks that harm goal pursuit, and our findings might simply reflect a rational attempt to offset these bad behaviors *after* temporal landmarks. For example, the fresh start effect could simply be attributed to the desire to counteract excessive caloric intake associated with weekends and holidays. We can rule out this alternative explanation in a number of ways. First, in Study 3, we rule out this alternative explanation by showing that following temporal landmarks, commitment contracts for health-irrelevant goals increase. Second, when we remove holidays that are particular excuses for gluttony (Independence Day, Labor Day, Thanksgiving, and Christmas), we still find a significant uptick in aspirational behaviors immediately following holidays and school breaks. Third, this compensatory alternative explanation cannot account for our consistent finding that aspirational behaviors are more intense at the start of the month than at the close of a month since neither the start nor the end of a new month is associated with increased indulgence. Finally, this alternative explanation suggests that engagement in aspirational activities would be significantly lower right before temporal landmarks than on other days. We can directly test whether this is the case by exploring whether people are indeed significantly less likely to engage in aspirational behaviors immediately before temporal landmarks than on other days across our three field data sets.

Although we hypothesize that temporal landmarks elevate the frequency of aspirational behaviors and that these effects weaken as people perceive temporal landmarks to be further away, our hypothesis does *not* predict that engagement in aspirational behaviors will be significantly lower in the short period immediately preceding (or during) a temporal landmark than on any other, typical day. Therefore, we created indicator variables for weekends, the last seven days of each month, the last seven days of each year, the seven days preceding the first workday after each Federal holiday (Studies 1 and 3), the seven days preceding the first school day after each school break (Study 2), the seven days preceding each semester's start (Study 2), and the seven days immediately before and including a person's birthday (Studies 2 and 3). We then added these additional predictor variables to our primary regression models (Models 1, 6, 7, 8, 9 and 10). If our findings were simply attributable to reduced engagement in aspirational behaviors prior to temporal landmarks, we would expect the coefficients on these new predictor variables to be significant and negative. In fact, among 29 new predictor variables across five regression models, only three predictor variables have a significant, negative coefficient at the 5% level,

which is not significantly more than the number that would be expected by chance. In addition, the inclusion of these predictor variables does not qualitatively change the coefficients on our primary predictor variables, which remain essentially the same in terms of magnitude and statistical significance. Therefore, it is unlikely that our findings are solely driven by people's reduced engagement in aspirational behaviors prior to temporal landmarks.

Another alternative explanation for our findings is that people do not have enough time and energy to tackle their goals before temporal landmarks and thus put off aspirational behaviors until after temporal landmarks have passed. Such an alternative account suggests that the period before a temporal landmark is not the good time to initiate goal pursuit and thus should be associated with a significant dip in the frequency of aspirational behaviors, but the analyses described above show that this is not the case. Further, while it is likely that the arrivals of some new mental accounting periods (e.g., following a wedding or a job change) are accompanied by more free time to tackle goals than the windows preceding them, people do *not* typically have more free time to pursue aspirational activities following most of the types of temporal landmarks studied in this paper (e.g., the beginning of a new week, the beginning of a new month, the first workday after a holiday, or during the first few months following a birthday) than before these temporal landmarks (e.g., on the weekend, at the end of the month, before or during a holiday, or in the few months preceding a birthday). To further address this alternative explanation, however, we recruited 53 participants online from Amazon's Mechanical Turk to participate in a survey about daily activities. They were first asked to list three activities that they had the tendency to put off doing until a future date when they thought they would have more time and energy. Next, participants were asked to select the subset of activities from their list that were *not* aspirational (see Electronic Companion Appendix F for the exact questions). A research assistant removed activities that fit our definition of "aspirational" and then identified the most frequently listed activity that participants tended to put off doing and that was not aspirational in nature: "laundry." Following the procedures described in Study 1, we downloaded daily Google search volume for this word from January 1, 2004 to June 30, 2012. We neither predict nor find that searches for "laundry" systematically increase following the temporal landmarks examined in Model 1 (see Model 4 in Table 1), suggesting that temporal landmarks do not simply increase the interest in all types of activities that require planning, time, and energy.

There are several other potential explanations for the documented fresh start effect besides the psychological processes we propose that can be ruled out. First, it could be argued that people generally embrace all types of new activities at the beginning of new cycles. Study 3 helps address this alternative account by showing that the fresh start effect is not confined to the adoption of new habits. For example, temporal landmarks are followed by an increase in the number of commitment contracts created for smoking cessation, an aspirational behavior that disrupts an existing habit (see Table 5). To further

address this alternative account, we recruited another 49 participants online from Amazon's Mechanical Turk to list three "new" activities that they had never engaged in before but would consider pursuing in the future. As in the survey we described above, we again asked participants to indicate the subset of activities on their list that were not aspirational (see Electronic Companion Appendix F for the exact questions) and asked a research assistant to remove activities that fit our definition of "aspirational". "Gardening" was the most frequently listed "new" activity that was not aspirational in nature. We did not find that Google searches for "gardening" systematically increase following the temporal landmarks examined in Study 1 (see Model 5 in Table 1), suggesting that temporal landmarks do not induce increased engagement in all types of new activities.

It is also important to note that some temporal landmarks, particularly personally-meaningful life events (e.g., a wedding, a job change) tend to alter one's surroundings and daily routines, which in turn trigger certain habitual actions. Past research has shown that altering one's surroundings and routines can lead to behavior change (Wood, Tam, and Witt, 2005). For example, a move to a new residence may promote a healthy lifestyle because recurring stimuli that cue old, unhealthy habits no longer exist (e.g., a favorite bakery is now far away). Alternatively, a move to a new residence may promote an unhealthy lifestyle because a favorite salad shop is no longer nearby and instead an ice cream parlor is just down the street. There are several reasons why we believe we can rule out this explanation for our findings. First, while many temporal landmarks do disrupt routines, many of those we study (e.g., the start of a new week/month, the celebration of a birthday) do not typically alter routines significantly. In fact, weekly and monthly cycles may actually reinforce routines. Second, this past research on habit disruption does not clearly predict whether contextual shifts that may be induced by certain types of temporal landmarks will lead to increases in aspirational or harmful behaviors. In fact, there is evidence that routine changes can disrupt beneficial habits such as reading the newspaper (Wood et al., 2005). Thus, past research on routines and habit formation does not seem likely to explain the fresh start effect detected in this paper.

It could be argued that some temporal landmarks associated with relaxation, such as weekends and holidays, might replenish self-regulatory resources, restoring the self-control that people need to tackle aspirational behaviors (Baumeister et al., 1998). Though repletion could contribute to the elevated motivation to pursue goals that we detect following weekends and holidays and strengthen the impact of the psychological processes highlighted in Section 2, this account cannot explain why people choose to engage in aspirational activities at a higher rate following the start of a new month or immediately following a birthday. Also, more nuanced analyses of our field data suggest that the observed fresh start effect is unlikely to be solely driven by changes in self-regulatory resources. Specifically, this alternative account predicts that the frequency of aspirational behaviors should be higher on Saturday and Sunday than Friday because having a day off from work or school is relaxing. However, eight regression models

where we replace *days since the start of the week* with six indicator variables – one for each day of the week from Tuesday to Sunday (with Monday omitted) – provide no consistent evidence that Friday is associated with lower engagement in aspirational behaviors than either Saturday or Sunday (see Models A1, A6-8, and A9-12 in the Electronic Companion). In concurrent research exploring the mechanism underlying the fresh start effect through laboratory experiments, Dai, Milkman, and Riis (2013) show that people are more motivated to pursue aspirational behaviors following more psychologically meaningful temporal landmarks (e.g., a meaningful birthday or job change) than objectively commensurate but less psychological meaningful temporal landmark (e.g., a typical birthday or job change). These findings help rule out relaxation as the sole explanation for the fresh start effect because psychologically meaningful temporal landmarks would not be expected to provide greater opportunities for relaxation than objectively identical but less meaningful landmarks.

6.2. Implications

The fresh start effect has significant practical implications for individual decision makers, managers, and policy makers. First, individuals can not only take advantage of their fresh start feelings at naturally-arising temporal landmarks to follow through on good intentions, but they may also be able construct fresh starts themselves by strategically “creating” turning points in their personal histories, such as moving to a new residence to start over (a previously-named phenomenon called “relocation therapy”; Kaufman, 2013). Second, our findings suggest new ways in which people may be effectively “nudged” (Thaler and Sunstein, 2008) to begin pursuing their aspirations. For example, messages designed to promote aspirational behaviors may be most impactful at fresh start moments (e.g., the beginning of a new month, right after holidays) when message recipients will be more interested in striving to achieve their long-term goals, as shown in this paper. Further, marketers of products designed to help people attain desirable objectives (e.g., retirement counseling services, gym memberships, online education programs) may best appeal to consumers’ desires for self-improvement by advertising at fresh start moments.

Another implication of this research is that framing certain days as opportunities for a fresh start (e.g., birthdays, the start of a new week/month/year, etc.) may help people make choices that maximize their odds of achieving their aspirations. For example, employers could potentially reframe transition points in the workplace (e.g., a desk move, or a return from vacation) to increase the adoption of aspirational activities (e.g., attending training workshops or onsite biometric screenings).

An important question related to the practical implications of fresh start effects is how long fresh-start feelings persist following the incidence of a temporal landmark. Plots (see Appendix G) suggest that the elevated motivation we document in this paper spikes on the first workday after a Federal holiday and declines rapidly thereafter, whereas motivation wears off much more gradually over the course of each

week, month, year, and semester. However, it is worth noting that even fleeting fresh start feelings following temporal landmarks can potentially be valuable for at least two reasons. First, the abundance of fresh-start opportunities throughout the year offer repeated chances for people to attempt positive self-change, so even if they initially fail, they may subsequently succeed (Polivy and Herman, 2002). Second, transient increases in motivation may be sufficient to help people fulfill important one-shot goals such as receiving a medical test or signing up for a 401(k) account with monthly payroll deductions. In this paper, we primarily study aspirational behaviors where the end goal requires engaging in a series of goal-directed actions (e.g., dieting, exercising, committing to a personal goal). It would be valuable for future research to examine the extent to which temporal landmarks can spur aspirational behaviors that only require a single action (e.g., getting a vaccine, donating to a charity).

6.3. Limitations and Future Directions

The empirical evidence presented in this paper primarily focuses on temporal landmarks associated with socially-constructed timetables (including the yearly calendar, work calendar, and academic calendar). Birthdays are the one exception and example of personally-relevant temporal landmarks studied here. Further, we focus on the Gregorian calendar given its relevance to the settings studied. Future research exploring and comparing a broader set of temporal landmarks, including temporal landmarks on different calendars (e.g., the Chinese New Year, the Jewish New Year) as well as additional personal landmarks (e.g., religious conversions, relocations, job changes, etc.) would be valuable. We expect that the fresh start effect likely extends to all temporal landmarks, not only those examined in this paper, though certain types of temporal landmarks may produce stronger effects than others (Dai, Milkman, and Riis, 2013).

In addition, the temporal landmarks highlighted here are all associated with either neutral or positive experiences. Temporal landmarks of negative valence (e.g., a divorce, the death of a family member) may not immediately increase motivation to pursue aspirations if people need to first cope with stressful experiences (Cohen and Hoberman, 1983). It would be valuable for future research to explore whether the fresh start effect extends to temporal landmarks stained by negative emotions such as grief, anger, and stress.

Our findings raise a number of other questions worthy of exploration. One such question is how the anticipation of a temporal landmark affects behavior. Some recent work suggests that people might feel less compelled to begin pursuing their goals when upcoming landmark events are highlighted because the future self (who will benefit from goal pursuit) feels more disconnected from the current self (Bartels and Rips, 2010; Bartels and Urminsky, 2011; Tu and Soman, 2013). On the other hand, Peetz and Wilson (2013) contend that when an intervening landmark event and a future desirable state are both made salient, the discrepancy between the current self and the future, desired self is highlighted, which motivates beneficial behaviors. Another possibility is that people may use upcoming temporal landmarks as self-

imposed deadlines and attempt to bring ongoing goals to closure by these deadlines (e.g., finish reading a book, complete an assignment). Our research suggests two other possible effects of anticipating an upcoming temporal landmark. First, anticipated temporal landmarks might liberate people to make goal-incongruent choices if they anticipate wiping the slate clean after an upcoming temporal landmark (Zhang, Fishbach, and Dhar, 2007). Second, if a decision maker foresees that a better opportunity to pursue her aspirations will arise following an impending temporal landmark (e.g., after her next birthday), she may strategically delay launching her plans until after the landmark. Future research exploring these possibilities would be valuable.

Further, future research could explore if and how social influence reinforces the fresh start effect. For example, a spike in goal pursuit on January 1 may partly reflect a social bandwagon effect. Though other fresh start moments highlighted in the current research (e.g., the beginning of the week or month) attract less attention, the fresh start effects we observe across three studies could be magnified in part by a social contagion process whereby others' engagement in aspirational activities stimulates increases in our own goal motivation. Exploring this hypothesis in future research would be valuable.

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Tables

Table 1. Model 1 reports the coefficients from an OLS regression predicting the relative Google search volume for “diet” as a function of a given day’s proximity to a variety of calendar markers. Standard errors are clustered at the three-month interval level. Models 2-5 predict search volume for the placebo terms “news”, “weather”, “laundry”, and “gardening” respectively, using the same regression specification as Model 1.

Google Search Term	Diet	News	Weather	Laundry	Gardening
	Model 1	Model 2	Model 3	Model 4	Model 5
Generic Calendar Predictors					
Days Since the Start of the Week (Monday)	-1.63*** (0.08)	-2.09*** (0.11)	0.72*** (0.17)	1.89*** (0.10)	2.23*** (0.13)
Days Since the Start of the Month	-0.09*** (0.02)	-0.05* (0.02)	0.09^ (0.04)	1.8e-03 (0.02)	-0.07 (0.06)
Months Since the Start of the Year	-3.81*** (0.42)	-0.05 (0.45)	0.93 (0.83)	-1.02* (0.41)	-1.29 (1.88)
Work Calendar Predictors					
First Workday after a Federal Holiday	7.40*** (0.73)	-1.76* (0.84)	0.77 (0.76)	2.89** (0.94)	0.29 (1.11)
First Workday x Fresh Start Score of Federal Holiday	6.78*** (0.65)	-2.19*** (0.54)	2.27* (0.73)	-0.26 (0.39)	-3.25*** (0.75)
Fixed Effects for Each Three-month Download Interval	Yes	Yes	Yes	Yes	Yes
Observations	3,104	3,104	3,104	3,104	3,104
R ²	0.62	0.81	0.53	0.33	0.32

^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2. Models 6-8 report the results from OLS regressions in which the dependent measure is the daily average visits per hour at a university gym (Model 6) and the likelihood that a given person visited the university gym on a given day (Models 7-8). Standard errors are clustered at the date level in Models 7 and 8. Predictor variables include measures of a given day's proximity to a variety of temporal landmarks.

Sample	All Undergraduate Gym Members		Members with Birthday Information
Regression Outcome Variable:	Average Gym Visits per Hour	Daily Individual Indicator ^b	Daily Individual Indicator ^b
	Model 6	Model 7	Model 8
Generic Calendar Predictors			
Days Since the Start of the Week (Monday)	-2.12*** (0.38)	-3.5e-03*** (6.8e-04)	-3.5e-03*** (7.5e-04)
Days Since the Start of the Month	-0.37*** (0.09)	-4.3e-04*** (1.2e-04)	-3.9e-04** (1.3e-04)
Months Since the Start of the Year	-0.66** (0.21)	-9.6e-04** (2.8e-04)	-7.1e-04* (3.0e-04)
Academic Calendar Predictors			
Months Since the Start of the Semester	-6.97*** (0.91)	-9.8e-03*** (1.1e-03)	-9.7e-03*** (1.3e-03)
First Day after a School Break	15.53*** (4.41)	0.02** (8.3e-03)	0.03** (9.4e-03)
Personal Calendar Predictor			
Months Since Last Birthday			-5.9e-04*** (1.0e-04)
Controls for School Session ^a	Yes	Yes ^b	Yes ^b
FE's for Each Gym Member	No	Yes	Yes
Observations	442	5,265,104	722,362
Number of Gym Members	11,912	11,912	2,076
R ²	0.67	0.14	0.14

^a $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a School session control variables include normal school session indicator (during the fall and spring semesters), summer session indicator, final exam period indicator, and days since the exam period starts.

^b Besides school session control variables, the number of operating hours on each date is included as a control variable.

Table 3. Summary Statistics for goal contracts created on stickK from October 1, 2010 to February 13, 2013 by goal category.

	Total Contracts		Daily Contracts			
	Sum	% of all contracts	Mean	SD	Max	Min
Custom Goal	28,830	43.64	33.29	19.58	174	3
Health-Irrelevant Custom Goal ^a	15,213	23.03	17.57	11.25	94	1
Health-Relevant Custom Goal ^a	12,976	19.64	15.04	9.25	78	0
Exercise Regularly	10,759	16.29	12.42	10.73	140	0
Lose Weight	23,823	36.06	27.51	27.14	349	4
Maintain Weight	403	0.61	0.47	0.70	4	0
Quit Smoking	1,500	2.27	1.73	1.88	24	0
Run a Race	747	1.13	0.65	1.10	7	0
All Types of Goals	66,062	100.00	76.28	55.68	687	16

^a The data set does not contain sub-category information for all custom goals, but instead for a subset of 28,189 (or 98% of) custom goals.

Table 4. Models 9 and 11 predict the daily number of commitment contracts associated with all types of goals (Model 9) and health-irrelevant custom goals (Model 11). Models 10¹⁸ and 12 predict the likelihood that a given user created a goal contract on a given day for all types of goals (Model 10) and for health-irrelevant custom goals (Model 12). Standard errors are clustered at the date level for Models 10 and 12. Across all models, independent variables include measures of a given day's proximity to a variety of temporal landmarks.

Goal Category	All Categories		Health-Irrelevant Custom Goals	
Regression Outcome Variable	Daily Number of Contracts	Did Individual Create a Goal? (Y=1, N=0)	Daily Number of Contracts	Did Individual Create a Goal? (Y=1, N=0)
	Model 9	Model 10 ^a	Model 11	Model 12 ^a
Generic Calendar Predictors				
Days Since the Start of the Week (Monday)	-5.73*** (0.79)	-1.2e-04*** (1.7e-05)	-1.12*** (0.16)	-1.0e-04*** (1.2e-05)
Days Since the Start of the Month	-0.49** (0.18)	-1.0e-05** (3.2e-06)	-0.06 (0.04)	-4.2e-06 (2.8e-06)
Months Since the Start of the Year	-6.09*** (0.43)	-1.2e-04*** (1.1e-05)	-1.24*** (0.08)	-1.0e-04*** (8.8e-06)
Work Calendar Predictors				
First Workday after a Federal Holiday	41.96*** (9.34)	8.0e-04** (2.3e-04)	5.81** (1.84)	4.9e-04* (2.2e-04)
First Workday x Fresh Start Score of Federal Holiday	67.74*** (8.60)	1.3e-03** (3.7e-04)	8.97*** (1.70)	6.0e-04* (2.3e-04)
Personal Calendar Predictor				
Months Since Last Birthday		-3.4e-06^ (1.9e-06)		-5.8e-06 (3.7e-06)
Days Since Launch	-0.01 (0.03)	-1.8e-07 (5.1e-07)	-0.01* (5.0e-03)	-6.6e-07 (4.5e-07)
Days Since Launch^2	5.5e-05^ (2.8e-05)	9.7e-10^ (5.8e-10)	2.8e-05*** (5.6e-06)	2.1e-09*** (5.4e-10)
FE's for Each StickK User	No	Yes	No	Yes
Observations	866	37,162,658	866	8,694,640
Number of StickK Users ^b	43,012	42,913	10,074	10,040
R ²	0.32	2.3e-03	0.35	2.5e-03

^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a This regression model includes the 99.5% of users whose birthdates were available to us.

^b This represents the number of stickK users who created at least one commitment contract in a corresponding goal category and thus were included in each corresponding regression model.

¹⁸ We only include regression results for the 42,913 users with a known birthdate because these users account for more than 99.5% of all users in our data set. When we predict the likelihood of creating a commitment contract on a given day as a function of the aforementioned predictors (with the exception of *months since last birthday*) for all 43,012 users in our data set, the regression results we obtain are virtually identical.

Table 5. Models 13-21 predict the daily number of commitment contracts associated with each of the three most popular health-irrelevant custom goals (Models 13-15), all health-irrelevant custom goals combined (Model 16), as well as each of the five standard goals (Models 17-21). Across all models, independent variables include measures of a given day's proximity to a variety of temporal landmarks.

Regression Outcome Variable	Daily Number of Contracts								
Goal Category	Career	Education and Knowledge	Money and Finance	Health-Relevant Custom Goals	Regular Exercise	Weight Loss	Weight Maintenance	Smoking Cessation	Running a Race
	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Generic Calendar Predictors									
Days Since the Start of the Week (Monday)	-0.59*** (0.05)	-0.25*** (0.06)	-0.08* (0.03)	-0.95*** (0.13)	-1.03*** (0.16)	-2.30*** (0.41)	-0.04** (0.01)	-0.17*** (0.03)	-0.09*** (0.02)
Days Since the Start of the Month	-0.01 (0.01)	-0.02 (0.01)	-0.02* (0.01)	-0.06* (0.03)	-0.07* (0.04)	-0.29** (0.09)	-2.1e-03 (2.7e-03)	-0.01 (0.01)	8.1e-05 (4.0e-03)
Months Since the Start of the Year	-0.33*** (0.03)	-0.30*** (0.03)	-0.13*** (0.02)	-1.05*** (0.07)	-1.08*** (0.09)	-2.41*** (0.22)	-0.02** (6.5e-03)	-0.12*** (0.02)	-0.07*** (9.8e-03)
Work Calendar Predictors									
First Workday after a Federal Holiday	0.16 (0.64)	1.93** (0.73)	0.94* (0.41)	6.77*** (1.54)	7.37*** (1.87)	20.10*** (4.80)	0.05 (0.14)	1.16** (0.35)	0.55* (0.21)
First Workday x Fresh Start Score of Federal Holiday	1.85** (0.59)	0.63 (0.67)	2.21*** (0.37)	7.48*** (1.42)	13.22*** (1.72)	36.64*** (4.42)	9.6e-03 (0.13)	1.42*** (0.33)	0.34^ (0.20)
Days Since Launch	-1.3e-03 (1.7e-03)	-1.3e-03 (2.0e-03)	9.0e-05 (1.1e-03)	9.2e-03*** (1.0e-03)	-3.8e-03 (5.1e-03)	4.8e-03 (0.01)	6.6e-04^ (3.8e-04)	6.9e-04 (9.6e-04)	-6.4e-04 (5.8e-04)
Days Since Launch^2	7.0e-06*** (1.9e-06)	5.5e-06* (2.2e-06)	1.2e-06 (1.2e-06)	1.9e-06 (1.0e-03)	9.4e-06 (5.7e-06)	1.9e-06 (1.5e-05)	-6.7e-07 (4.3e-07)	-1.4e-07 (1.1e-06)	8.3e-07 (6.4e-07)
Observations	866	866	866	866	866	866	866	866	866
Number of StickK Users ^a	3,068	2,944	1,399	8,493	9,695	20,273	327	1,329	700
R ²	0.31	0.16	0.13	0.33	0.27	0.25	0.03	0.14	0.10

^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^a This represents the number of stickK users who created at least one commitment contract in a corresponding goal category and thus were included in each corresponding regression model.

FIGURES

Figure 1. Changes in the fitted daily search volume for the term “diet” as a function of the date and its proximity to a variety of temporal landmarks. These effects are compared with the effect of the *New York Times* releasing a report about a promising new diet pill¹⁹ on searches for the term “diet.”

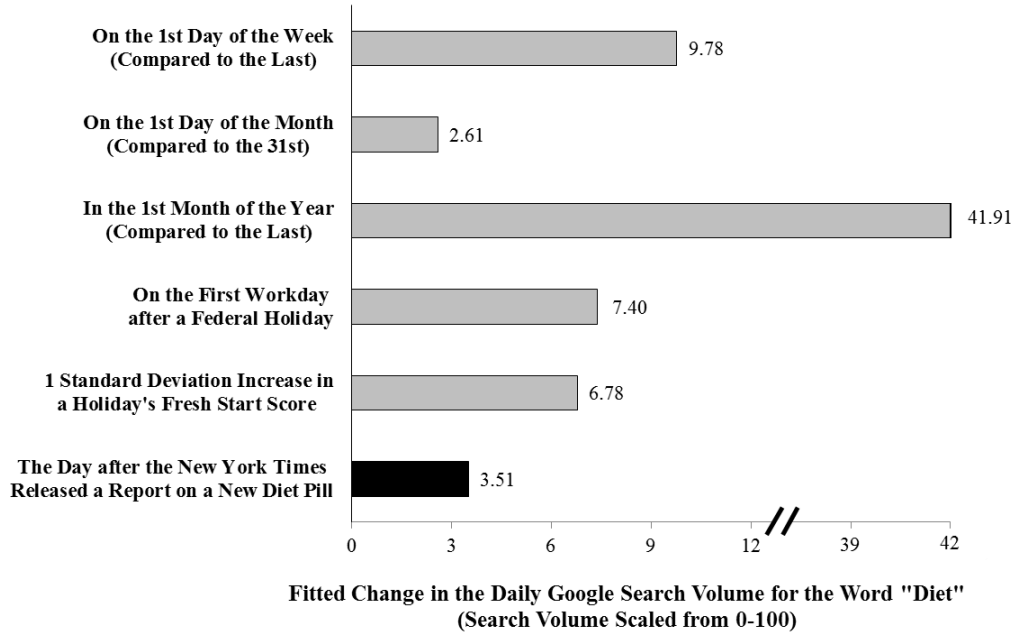
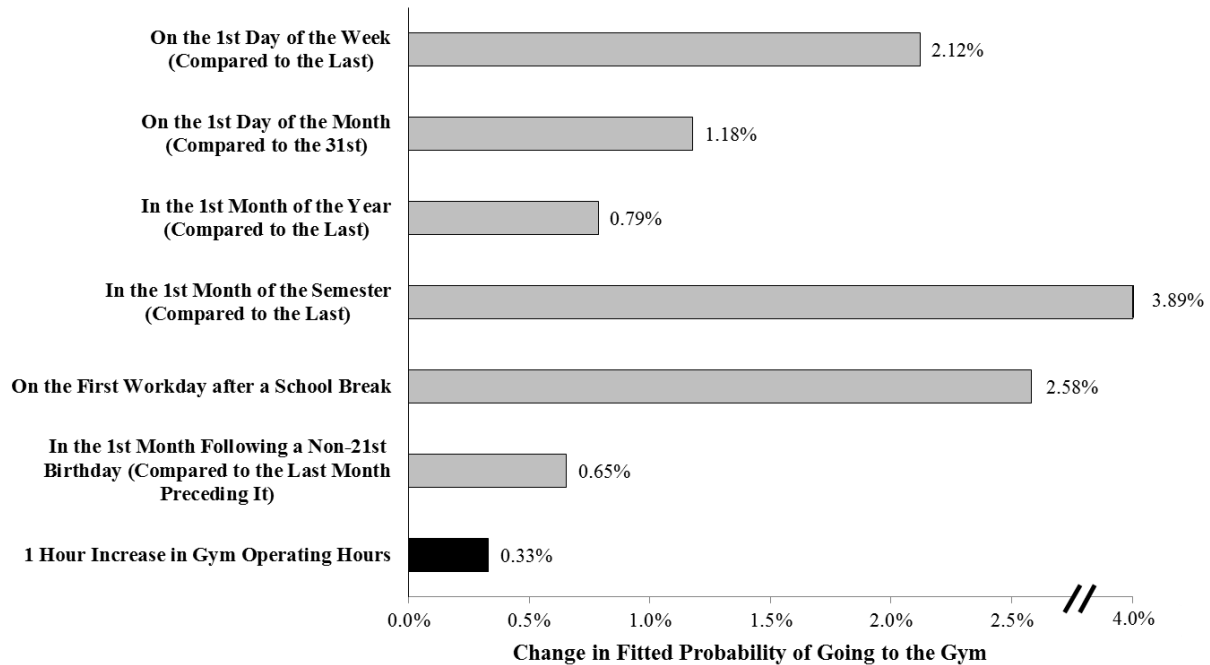
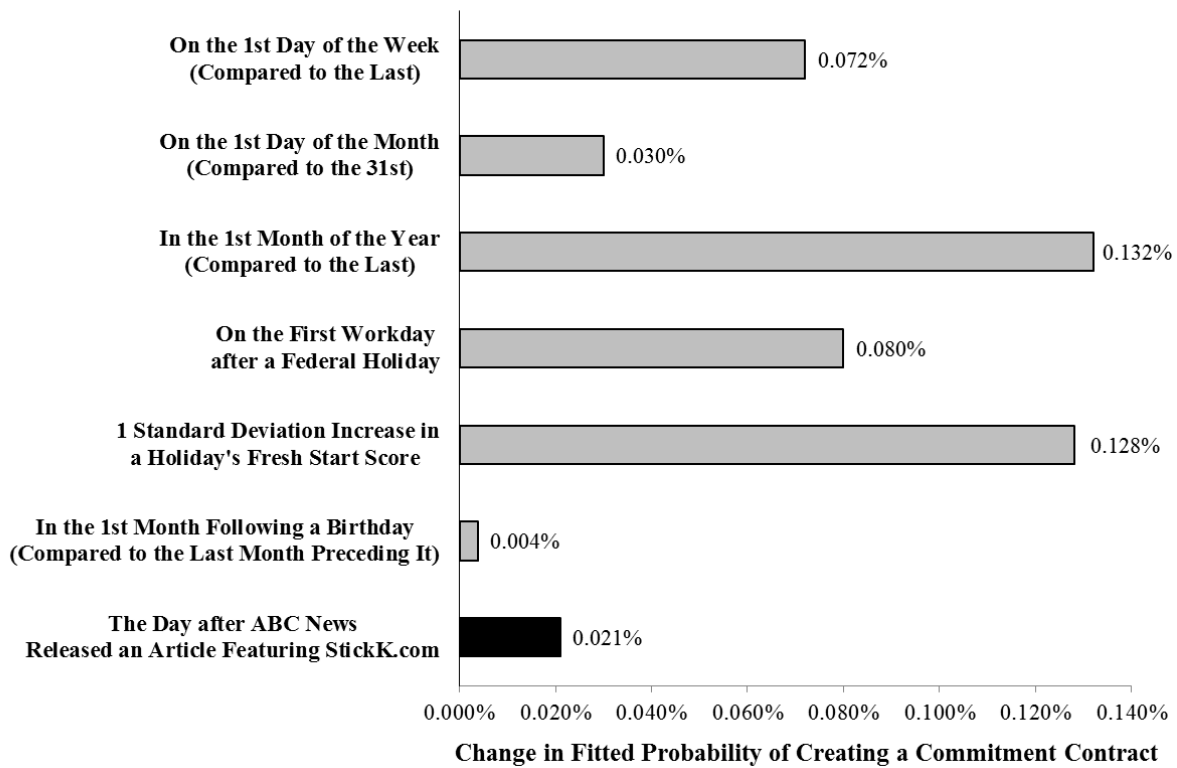


Figure 2. Changes in the fitted probability of going to the gym as a function of the date and its proximity to a variety of temporal landmarks. These effects are compared with the effect of a one-hour increase in the gym’s operating hours on the likelihood of going to the gym.



¹⁹ www.nytimes.com/2005/05/11/business/11drug.html

Figure 3. Changes in the fitted probability of creating a commitment contract as a function of the date and its proximity to a variety of temporal landmarks. These effects are compared with the effect of *ABC News* releasing an article featuring stickK²⁰ on the likelihood of creating a commitment contract.



²⁰ <http://abcnews.go.com/Business/stickk-websites-pay-cash-meet-goals/story?id=15904736#.UbISLJwV85J>