

Does it matter if a week starts on Monday or Sunday?

How calendar format can boost goal motivation

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Abstract

The present research examines whether viewing a calendar depicting the present day as the first day of a new temporal category affects the motivation to pursue ongoing personal goals.

Motivation peaked when the calendar's starting day (e.g., Sunday) matched the current day (e.g.,

Sunday) compared to when the calendar started on a different day (e.g., Monday, Studies 1a, 1b,

2). Viewing a calendar that portrayed the week as starting today (vs. a control calendar) also

translated to greater self-reported progress on three personal goals over the next day (Study 2).

The calendar format effect was present in both between-subjects designs (Study 1a, 1b, 2) and

within-subjects design (Study 3). These studies extend research on the influence of temporal

categories on projected goal pursuit to show the impact of calendar formats on motivation in the

moment.

Keywords: Time perception, Calendar, Motivation, Goal pursuit, Fresh Start Effect

Time as represented in the Gregorian calendar – dividing time into 12 months, 52 weeks, and seven days per week – is a social construction. This conceptualization of time, however, touches on our lives daily. When planning events from dentist appointments to weddings, when organizing upcoming projects, we schedule them in calendars that organize the future into days, weeks, and months and visually represent the abstract concept of time. Some of the aspects of this visual time representation are arbitrary but potentially impactful, such as whether each week is portrayed to begin on Sunday or Monday. We examine whether the start day of a weekly calendar affects in-the-moment motivation and self-reported progress on personal goals.

Time representation is flexible

How people think about time is flexible. Subjective temporal distance to any point in time is only loosely linked with objective temporal distance – what feels close to one person can feel like ancient history to another (Pennington & Roese, 2003; Wilson & Ross, 2001). The same point in the future could be accurately described as happening ‘this month’, ‘two weeks from now’, ‘after my birthday’, or ‘the first Monday after Mother's Day’. These descriptions can translate into different mental categories, such as when a future point in time is described as happening before vs. after a significant event. People feel more connected to future events and selves that occur *before* significant events like calendar holidays (“Mother's Day”) because they are in the same temporal category as the present (Peetz & Wilson, 2013). Additionally, temporal categories can be created by visual or verbal descriptions (Hennecke & Converse, 2017; Peetz & Wilson, 2013; Tu & Soman, 2014). For example, if the present day was shaded the same (vs. a different) colour as the due date for a task, individuals initiated tasks earlier and focused more on concrete implementation intentions (Tu & Soman, 2014), arguably because the due date was perceived as in the same mental category as today.

The mental conceptualization of where a ‘new’ temporal category begins is influenced by conventional temporal markers (e.g., first of the month, first day of the week; Dai, Milkman, & Riis, 2014; Hennecke & Converse, 2017), and can also be affected by the visual cues, such as the coloring of days portrayed in a calendar (Tu & Soman, 2014), the highlighting of calendar holidays (Peetz & Wilson, 2013, 2014), or the emphasizing of days vs. months in calendars (Myrseth, 2009; Peetz & Epstude, 2016). In sum, apparently inconsequential design details (i.e., the pattern of shading, calendar units, labeling weekdays or days of the month) may change how time is perceived.

Time representation matters

One function of calendars and other visual representations of time is planning and organizing goal pursuit. So it is perhaps not surprising that one of the most impactful outcomes of time representation is its impact on goal-directed cognition and behavior. Time representation has been shown to affect monetary (Lewis & Oyserman, 2015; Tu & Soman, 2014), academic (Myrseth, 2009), and health (Ayers, Althouse, Johnson, Dredze, & Cohen, 2014; Peetz & Wilson, 2013; Welding et al., 2017) goals.

One reason that calendar representations boost goal-pursuit is through signaling a ‘fresh start’, an opportunity to break with past habits and begin a new regime of goal-orientated behavior (Dai, Milkman, & Riis, 2015). One of the most common signals of a new temporal category is the start of a new week. On Mondays, online searches for the word ‘diet’ peak (Dai et al., 2014), online searches for health behaviours are more common (Ayers et al., 2014), and enrollment in smoking cessation interventions increases (Welding et al., 2017). Indeed, participants interviewed about exercise preferences reported preferring Monday more as a ‘start day’ and Sunday as a ‘rest day’ (Consolvo, Klasnja, McDonald, & Landay, 2009).

However, perceiving Mondays as the best day for a fresh start seems to be at least in part dependent on how time is conceptualized. Participants preferred to start eating more healthily on Mondays when they viewed a calendar that emphasized weekdays, but when presented with a calendar that emphasized the days of the month, they planned to start their healthy eating regime on the first of the month, which happened to fall on a Wednesday (Hennecke & Converse, 2017, Study 1). Similarly, when framed as “the first day of spring”, even a Thursday can feel like a new beginning and elicit goal-directed behaviors (Dai et al., 2015). Thus, the motivation boost conferred by perceiving a new temporal category seems to be dependent on which temporal category markers (e.g., new week, new month, new year) is salient.

Notably, past research has examined representations of *future* time (i.e., the next days, Hennecke & Converse, 2017; Myrseth, 2009; Tu & Soman, 2014; the next months, Dai et al., 2015; Peetz & Epstude, 2016; the next years, Lewis & Oyserman, 2015) by re-framing upcoming time periods. Can representation of the *present* moment (whether the present day is perceived as the start) also affect goal motivation? The present studies aim to examine calendar format effects on in-the-moment goal motivation and also extend existing research by examining self-reported goal progress.

Contributions

The present research aims to examine how two plausible ways to conceive a week – with Sunday or Monday as first day of the week – affects the motivation to pursue ongoing personal goals. The present studies complement research that showed individuals are more likely to plan for future goal pursuit (e.g., Dai et al., 2015) and are more likely to initiate goal pursuit at the beginning of temporal boundaries (e.g., Hennecke & Converse, 2017). Extending on this research, the present studies examine the effect of temporal categories on self-reported

motivation to work on a variety of personally important goals. The extant literature on the fresh start effect has focused on trace evidence of motivation (e.g., google searches, registrations). We expected participants to consciously report being more motivated to work on their goals, replicating the fresh start effect.

The present research also extends on past work by examining a ubiquitous, mundane, and equally plausible way to conceptualize a week: Sunday or Monday as the first day on a weekly calendar. While the idea that Mondays symbolize temporal category boundaries has been fundamental to the seminal work on the “fresh start” effect (Dai et al., 2014), we observe that weekly calendars start with Sunday as often as Monday, and thus may shift an individual’s perception of temporal categories depending on which calendar format is salient to them. We first examine the prevalence of conceptualizing a week starting on Sunday vs. Monday (pilot studies). We then examine individuals’ motivation to work on ongoing personal goals in-the-moment (Study 1) and self-reported progress made towards these goals (Study 2) as a function of the format of the weekly calendar they were assigned to view. We also examine differences between calendar formats within participants on Sunday and Monday (Study 3).

Pilot Study 1

We explored the format of calendars across the world by gathering a representative sample of calendars from various countries. We searched Google Images for the search term “August 2017” for 67 countries (a full list of countries is available in the supplemental materials) using the country’s own Google page (e.g., google.de for Germany).¹ For each search, we used the search term in the country’s official language(s) and coded approximately the first 15

¹ The search region in Google search settings was not changed from ‘current region’. Search results did not differ considerably if one used the current region or the specific country’s search region.

calendars returned of online search results ($M = 9.00$ calendars per country, $SD = 3.76$).

Calendars started on Monday ($n = 390$ calendars; 63%), Sunday ($n = 203$ calendars; 33%), and Saturday ($n = 22$ calendars; 4%). The start day of calendars differed across countries; a world map depicting calendar formats is portrayed in Figure 1.²

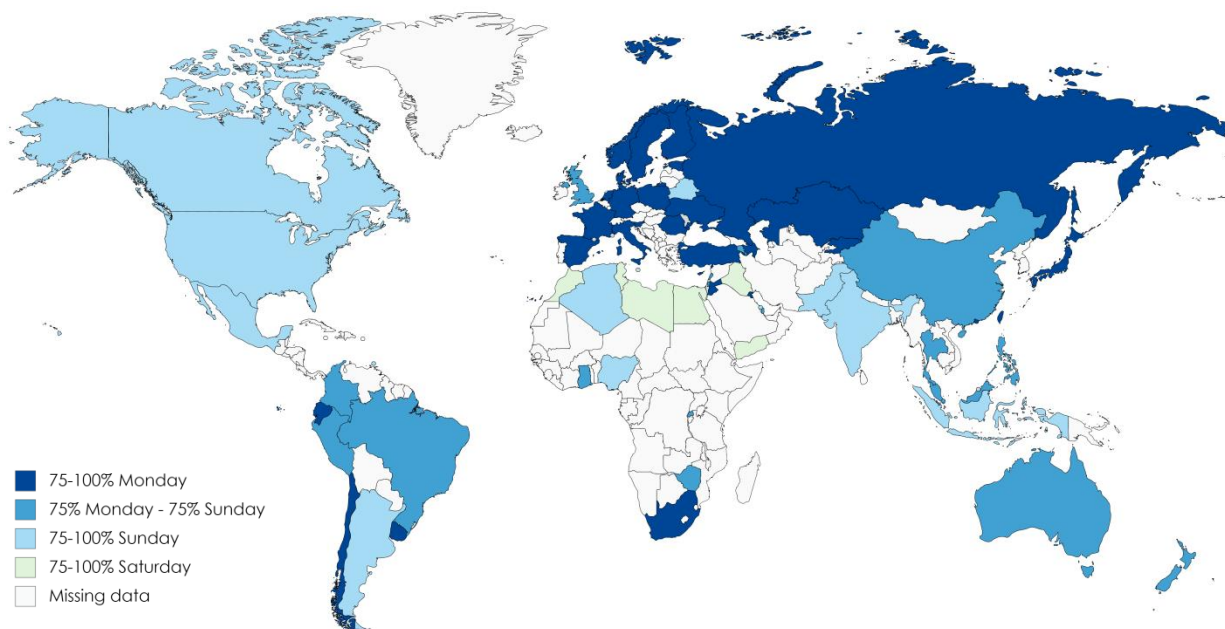


Figure 1. First day of the week in calendars across the world.

Pilot Study 2

In a second preliminary study, we explored the personal experience of calendar users in North America. A sample of 260 U.S. MTurk workers ($M_{\text{age}} = 39.42$ years, $SD_{\text{age}} = 12.99$; 50.4% female) reported how often they look at calendars in a regular day, what weekday their calendars start with, and what day they personally consider the start of the week. Participants reported checking their calendars at least once a day (45.4%) or more often than once a day (47.7%). The

² These results were replicated using the Java Standard Library that provides default date information for Java applications in programming languages around the world (see OSM for map).

majority of calendars were reported to start on Sunday (77.6%), in line with the predominant calendars in the U.S. according to Pilot Study 1. However, when asked about their *perception* of when the week starts, the majority of participants preferred Monday as the first day of the week (58.7%), followed by Sunday (37.8%) and other days (e.g., Saturday, Thursday; 3.5%).

In sum, two pilot studies established that the first day of a weekly calendar may vary both within a country, as well as between countries, and that both Monday and Sunday are plausible ways to represent the start of a week. The discrepancy between thinking of Monday as the start of the week, even though most calendars start the week with Sunday (Pilot 2), suggests some mental flexibility in which day of the week may be construed as the start day. Next, we examined the effect of experimentally varying the weekly calendar format between Sunday and Monday as the first day of the week.

Recruitment and reporting

In all studies we recruited MTurk or Crowdfunder workers from the U.S. and Canada. We determined sample sizes in advance of data analysis. A description of the preregistrations, the unabridged surveys, and the data are available in the online supplemental materials (OSM) at <https://bit.ly/2JI8RIP>. Table 1 presents sample details. All data was collected prior to analysis. All manipulations, measures, and exclusions in the study are disclosed either in the main text or in the online supplemental materials.

Table 1
Sample Characteristics and Power calculations across studies

| <i>Study</i> | <i>Design</i> | <i>Final N</i> | <i>Goals</i> | <i>Power^a</i> | <i>Female (%)</i> | <i>Age in years M_{age} (SD_{age})</i> | <i>Payment (\$USD)</i> |
|--------------|-----------------------------------|----------------|--------------|--------------------------|-------------------|--|------------------------|
| Study 1a | 2 x 2, between subjects | 227 | 677 | .96 | 48.9 | 38.83 (12.04) | \$0.50 |
| Study 1b | 2 x 2, between subjects | 223 | 669 | .95 | 47.5 | 36.81 (11.64) | \$0.50 |
| Study 2 | 2 conditions, between subjects | 215 | 645 | .96 | 55.8 | 39.24 (11.35) | \$0.50 + \$0.75 |
| Study 3 | 2 conditions, mixed design | 272 | 1509 | .94 | 54.6 | 39.94 (12.78) | \$0.50 + \$0.50 |

Note. In each study, additional participants were excluded if they did not interact with the calendar as instructed (Study 1a: $n = 11$, Study 1b: $n = 23$, Study 2: $n = 12$, Study 3: $n = 9$), and if they did not list at least one goal (Study 1a: $n = 12$, Study 1b: $n = 17$, Study 2: none, Study 3: $n = 3$). In Study 2 and 3, we did not consider those who did not complete Time 2 measures (Study 2: $n = 149$, Study 3: $n = 197$). See OSM for a discussion of attrition. In Study 3, we also excluded those participants who had a pre-existing weekday preference and stated they usually only complete studies on one or the other day ($n = 47$). ^a Post-hoc power to detect a medium effect ($f = .25$). This was calculated for F-tests and does not account for the repeated goal ratings for each participant (i.e., they are approximate and conservative estimates).

Study 1

We examined the impact of conceptualizing either Sunday or Monday as the first day in a weekly calendar on goal motivation. We assessed participants' motivation to pursue three personally relevant, self-nominated goals on a Sunday and Monday. We hypothesized that people would be more motivated to work on their goals on Mondays than Sundays in line with the fresh start effect (Dai et al., 2014; 2015). However, we further expected that calendar format might moderate this effect such that the fresh start effect would be attenuated when the calendar showed Sunday rather than Monday as the first day of the week.

Method

Participants completed the study on either Sunday or Monday. In Study 1a, we recruited participants on two consecutive day (July 16, July 17) and in Study 1b we recruited participants

on the Monday and Sunday bracketing one week (August 28, September 3). Study 1a also included a number of additional variables that were not included in Study 1b (see OSM). After a brief demographic questionnaire, participants were randomly assigned to view a calendar of the current week that portrayed either Sunday or Monday as the first day of the week (see Figure 2). We coded the calendar format condition to compare those who viewed a calendar portraying the week as starting with the present day with those viewing a calendar portraying the week as starting with a control day, respectively. The calendar design was copied from Google Calendar (DD/MM date format). To ensure that participants noticed the calendar, they were instructed to select the current day on the calendar. As a measure of goal motivation, participants briefly described three goals they were currently pursuing (e.g., “call doctor for testing”, “clean the house”, or “buy a new car”). Participants then indicated how motivated they were to do something towards each goal *right now* (1 = *Not at all motivated*, 7 = *Extremely motivated*).

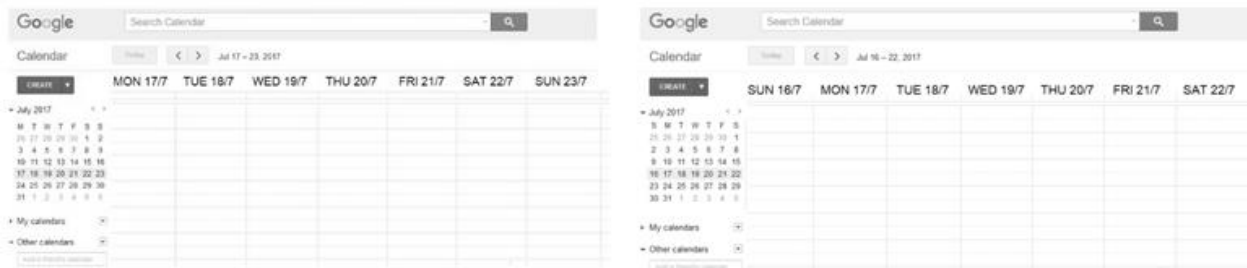


Figure 2. Calendar format manipulation for Study 1.

Results Study 1a

Participants listed a total of 677 personal goals (not all participants listed three goals). Because each participant nominated and rated several personal goals, we conducted a multi-level model where motivation ratings were nested within participants, and where participants are

nested within conditions.³ Time of study (Monday vs. Sunday) and calendar format (today as first day vs. control condition) were entered as fixed between-subject factors (See Table 2 for Means). The model showed a significant main effect of time of study, $F(1, 658.39) = 6.84, p = .009, n_p^2 = .01$, and a significant main effect of calendar format, $F(1, 658.39) = 6.48, p = .011, n_p^2 = .01$, on goal motivation, and no significant interaction term, $F(1, 658.39) = 1.49, p = .223, n_p^2 = .002$. Participants were more motivated to pursue their goals on Monday than Sunday, replicating the fresh start effect (See Table 2 for Means). Participants were also more motivated when they saw a calendar that showed today as the first day than when the calendar started on another day.

Results Study 1b

All participants listed three goals each for a total of 669 personal goals. A multi-level model where motivation ratings were nested within participants, and where participants are nested within conditions, showed no significant main effect of time of study ($F(1, 664.64) = 1.96, p = .162, n_p^2 = .003$), a significant main effect of calendar format on goal motivation ($F(1, 664.64) = 7.98, p = .005, n_p^2 = .02$), and no significant interaction term, $F(1, 664.64) = 0.18, p = .676, n_p^2 < .001$. As in Study 1a, those who saw today as the first day on a calendar week were significantly more motivated to pursue their goals that day than those who saw a different day as the first day (See Table 2 for Means).

³ We also replicated all MLM analyses in this and subsequent studies by aggregating the three goal motivation ratings and analyzing this motivation index in a 2 (time of study) by 2 (calendar format) ANOVA (see online supplemental materials).

Table 2
Means and Confidence Intervals (95%) by Time of Study and Calendar Format Condition

| | | <i>Time of Study</i> | | | |
|----------|---|---------------------------------------|--------------------------|---------------------------------------|--------------------------|
| | | <i>Participated on Sunday</i> | | <i>Participated on Monday</i> | |
| | | <i>Calendar Format</i> | | <i>Calendar Format</i> | |
| | | <i>Today as first day on calendar</i> | <i>Control</i> | <i>Today as first day on calendar</i> | <i>Control</i> |
| Study 1a | Goal motivation ^a | 6.08 [5.90, 6.27] | 5.72 [5.53, 5.91] | 6.22 [6.03, 6.42] | 6.09 [5.89, 6.28] |
| | Number of goals | 186 (<i>n</i> = 62) | 173 (<i>n</i> = 58) | 157 (<i>n</i> = 53) | 161 (<i>n</i> = 54) |
| Study 1b | Goal motivation ^a | 5.90 [5.67, 6.13] | 5.53 [5.29, 5.76] | 5.69 [5.46, 5.92] | 5.41 [5.19, 5.64] |
| | Number of goals | 165 (<i>n</i> = 55) | 162 (<i>n</i> = 54) | 168 (<i>n</i> = 56) | 174 (<i>n</i> = 58) |
| Study 2 | Goal motivation ^a T1 | 5.86 [5.70, 6.02] | 5.51 [5.35, 5.67] | | |
| | Absolute goal progress in % T1 | 38.02 [34.86, 41.18] | 35.71 [32.49, 38.92] | | |
| | Any steps taken to achieve goal since yesterday? T2 | 53% yes | 47% yes | | |
| | Progress since yesterday ^a T2 | 3.31 [3.09, 3.54] | 2.87 [2.64, 3.09] | | |
| | Absolute goal progress in % T2 | 42.69 [39.11, 46.27] | 36.79 [33.19, 40.40] | | |
| | Number of goals | 327 (<i>n</i> = 109) | 318 (<i>n</i> = 106) | | |
| | | | | | |
| Study 3 | Goal motivation ^a | 5.38 [5.21, 5.56] | 5.27 [5.09, 5.44] | 5.40 [5.22, 5.59] | 5.19 [5.02, 5.37] |
| | Number of goals | 381 (<i>n</i> = 127) | 390 (<i>n</i> = 130) | 351 (<i>n</i> = 117) | 387 (<i>n</i> = 129) |

Note. T1 = Time 1, T2 = Time 2. In all studies, the control condition included a calendar starting with the other day of the week (i.e., Monday if study was run on Sunday). *n* represents the number of participants in each condition. ^a on a 7-point scale

Discussion

Two separate samples showed that motivation to work towards personally important goals was higher when the present day was portrayed as first day of the week. We also found somewhat mixed evidence for greater overall motivation on Mondays than Sundays, in line with the fresh start effect.

Study 2

In the next study we examined whether the boost in motivation elicited by calendars that framed the present day as the first day of the next week would translate into self-reported goal progress. We recruited participants on a Sunday (November 26) and presented them with a calendar starting either on Sunday or Monday. We then followed up on the next day (Monday November 27) to assess whether participants had taken any steps towards the goals on Sunday and whether they made progress towards achieving these personal goals.

Method

Time 1. After a demographic questionnaire assessing only gender and age, participants were randomly assigned to view a calendar that portrayed the next week as starting on the current day (i.e., Sunday) or a control calendar starting on Monday (DD/MM date format). Participants were instructed to select the current day on the calendar. Participants then described three personal goals and rated their motivation to pursue each of the three goals *right now*. Participants also reported their absolute goal progress for each of the three goals using a slider bar (0% = *Nothing yet*; 100% = *Fully accomplished*).

Time 2. The following day, participants received an email inviting them to do the second survey. Each participant was reminded of their personal goals they described in the initial survey (their own description of each goal was quoted in the survey). For each goal, they reported

whether they took any steps to work on the goal since yesterday (1 = *Yes*; 0 = *No*), how much progress they made on achieving the goal since yesterday (1 = *No progress*; 7 = *A lot of progress*), and their absolute goal progress (0% = *Nothing yet*; 100% = *Fully accomplished*). They also rated additional exploratory variables (ease of goal initiation, effort, motivation) at Time 2, see OSM for results.

In an exploratory section of the follow-up survey, participants reported on the calendars they use in their daily life and reported lay beliefs about the influence of calendar format on goal pursuit. Participants reported whether they thought calendar format mattered for when they start a goal and for how they pursue their goals (1 = *Does not matter at all*; 7 = *Matters a great deal*). They also reported whether they have ever changed the calendar format in one of the calendars they use (1 = *Yes*, 0 = *No*).

Results

Time 1. All participants listed three goals, resulting in a total of 645 goal ratings. A multi-level model where motivation ratings were nested within participants, and where participants are nested within calendar format condition, showed a significant effect of calendar format on motivation, $F(1,615.74) = 9.33, p = .002, \eta_p^2 = .02$. Those who viewed a calendar where the present day was the first day of the week were more motivated to work on their personal goals right now than those who viewed the control calendar (Table 2). The absolute progress towards these goals at Time 1 did not differ between calendar format conditions, $F(1,638.41) = 1.02, p = .313, \eta_p^2 = .002$.

Time 2. Next, we assessed whether calendar format had an impact on how much progress participants made on their goals in the next 24 hours. Averaged across all three goals, participants in the first day of the week condition reported having taken steps towards more of

their goals ($M = 1.95$, $SD = 0.93$) than participants in the control condition ($M = 1.72$, $SD = 0.88$), and this difference was marginally significant, $F(1,213) = 3.69$, $p = .056$, $n_p^2 = .017$. A multi-level model where reports on goal progress since yesterday was nested within condition showed an effect of calendar format condition, $F(1,638.78) = 7.43$, $p = .007$, $n_p^2 = .01$. We also examined how much participants progressed towards the goal achievement on absolute terms. Calendar format had an effect on absolute goal progress at Time 2 (controlling absolute goal progress at Time 1), $F(1,628.97) = 4.78$, $p = .029$, $n_p^2 = .008$. Participants who had seen the calendar portraying the present day as first day of the week reported being an average of 4.67% closer to achieving their goal and participants who had seen the control calendar reported being 1.08% closer. However, this variable should be interpreted with caution as several participants reported less absolute goal progress on Monday than on Sunday (likely because they misunderstood the question to be about absolute goal progress since yesterday).

Exploratory analyses on lay beliefs about calendar effects. All participants reported using at least one calendar in their daily life. The most used types of calendar were calendar apps (49.3%) and paper wall calendars (42.3%). Participants did not believe that calendar format matters for goal initiation ($M = 2.95$, 95% CI [2.67, 3.23]) or goal pursuit ($M = 2.92$, 95% CI [2.63, 3.21]). Indeed, the modal response was “Does not matter at all” for both goal initiation (42.3%) and goal pursuit (42.9%). Perhaps because they did not believe that calendar format mattered, the majority of participants (84.7%) reported never having changed the format of their calendars.

Discussion

This study showed that calendar format affected not only motivation, but also self-reported goal progress the next day. Participants viewing a calendar that portrayed the day of the

study (i.e., Sunday) as the first day of the next week reported more subjective progress on three personal goals than participants viewing a calendar that portrayed Monday as the first day of the week. Importantly, participants were not reminded of the calendar when they reported on goal progress the next day, so any differences between calendar format conditions were due to the experimental manipulation the day before. This study also suggested that the effects of calendar formats may not be intuitive – participants did not believe that calendar format influenced their motivation or goal progress.

Study 3

The previous studies recruited individuals on Sundays or Mondays before randomly assigning them to view different calendars. A limitation of such a design is that participants who self-selected into the study on Monday or on Sunday, respectively, might have a preference not only for doing studies on these days but also for their calendars to start on that day. To rule out that such a pre-existing preference between participants explains the calendar effect on motivation we observed in the previous two studies, we conducted a follow-up study. In this study, rather than recruiting different samples on each day, we recruit the same people on both Sunday and on Monday (i.e., a within-subject design). In addition, we only considered people who do not report a preference for doing studies on one of the two days, to avoid pre-existing preferences. Participants were randomly assigned to one of the two calendar conditions on Sunday and were randomly assigned to one of the two calendar conditions on Monday. Each time they were asked to list three goals and rate their motivation for these goals. As in the previous studies we expected that participants who saw the calendar portraying today as the first day would feel more motivated to work towards their goal today than participants in the other calendar condition, regardless of weekday.

Method

We recruited participants on Sunday (October 21) and contacted the same participants again the following day (Monday October 22). Participants had 12 hours to complete the survey each time. In both surveys, participants were randomly assigned to a calendar as first day condition or a calendar control condition, described three goals and rated their motivation to work towards each goal right now. Participants were permitted to report the same goals on both days. Two-thirds of the goals that were listed on Monday were the same or similar as the goals listed by that person on Sunday. This variable was not a significant covariate and did not change the results of the main analysis and thus will not be discussed further.

Finally, participants were instructed to “select all days of the week on which you typically complete MTurk hits”. The results reported below are based on participants who selected both Sunday and Monday (and those who selected neither), to rule out pre-existing preferences for one day over the other. Participants also reported the day that is portrayed as first day of the week on their own, most frequently used, calendar (81% reported Sunday as first day, presumably because this was a U.S. sample). This variable was a significant covariate but did not change the direction or significance level of the analyses reported below and thus will not be discussed further (see OSM for details on exploratory covariates).

Results

Not all participants listed three goals on both days, resulting in a total of 1509 goal ratings. A multi-level model where motivation ratings were nested within participants, and the weekday (Sunday vs. Monday) and the Calendar condition (today as first day vs. control) were entered as fixed factors, showed no significant main effect of time of study ($F(1, 1501) = .09, p = .763, \eta_p^2 < .001$), and no significant interaction term ($F(1, 1501) = .24, p = .622, \eta_p^2 < .001$).

However, in line with expectations and with the previous studies, the a main effect of calendar format condition was marginally significant, $F(1, 1501) = 3.25, p = .072, \eta_p^2 = .002$. Participants who saw the current day as the first day on the calendar reported feeling marginally more motivated to pursue their goals regardless of the weekday (Table 2).

Discussion

This final study suggests pre-existing preferences for participating in studies on Sunday or Monday was unlikely to produce the motivating effect of viewing calendars portraying today as first day of the week. When the same sample of participants who reported no pre-existing preferences for working on Sunday or Monday completed the study on both days, the calendar format effect replicated (although it should be noted that the effect was only marginally significant in this study).

General Discussion

One of the many arbitrary aspects of time representation is the conceptualization of a week as starting with Monday or Sunday. While most calendars in North America appear to start with Sunday (Pilot Studies 1, 2, Study 2, 3), Mondays *feel* more like the start of the week (Pilot Study 2, Study 3, Consolvo et al., 2009), making both plausible starting points for a weekly calendar. Since motivation peaks at the beginning of temporal categories (e.g., Dai et al., 2014, 2015) we examined the impact of viewing a weekly calendar starting on Sunday versus Monday on self-reported motivation to pursue a variety of personally important goals. Four studies showed that motivation increased when viewing a calendar that portrayed the present day as the first day of the week than when viewing a calendar that portrayed another possible day as the first day of the week. This finding extends existing work on the influence of temporal categories on future goal pursuit and motivational traces (Dai et al., 2015; Hennecke & Converse, 2017; Tu

& Soman, 2014) to in-the-moment motivation (Studies 1a, 1b, 2, 3) and self-reported progress on goals (Study 2). Possible mechanisms for the differences in motivation may be that new temporal categories psychologically distance the self from past failures (Dai et al., 2014), or that seeing today as beginning of a new temporal category induces a future focus (rather than present or past focus), which can be motivating (Corcoran & Peetz, 2014).

Implications for the fresh start effect. The present studies also provide some evidence that participants tended to report more motivation on Mondays than on Sundays (in Study 1a, although not Study 1b or Study 3), in line with the fresh start effect. The calendars may interfere with participants' intuitive temporal categories and override the impact of weekdays on motivation. Indeed, it is possible that the original fresh start effect would have been attenuated if participants had happened to check or interact with their personal calendars during data collection, because North American samples (Dai et al., 2014, Study 1-3) would likely use calendars starting on Sunday. Future studies might explore formal and subjective representations of temporal categories further. For example, temporal categories defined by personal events (Peetz & Wilson, 2013; 2014) might be even more impactful than formal temporal categories defined by the Gregorian calendar.

Limitations. The experimental manipulation in the present studies included only minimal interactions with the manipulated time representation – viewing and clicking on a calendar – to simulate everyday interactions with calendars. Perhaps as a result of this minimal manipulation, the effect on motivation was very small (average effect size across studies was $d = 0.22$, 95% *CI* [0.04, 0.41], equivalent to a small effect⁴; Cohen, 1988), although it was consistent, replicating

⁴ Mean effect size computed based on ANOVA results. There was no significant heterogeneity in the effect sizes, Cochran's $Q = 2.16$, $p = .54$, $I^2 = 0\%$

four times. Future research might increase the impact of viewing different calendar formats by drawing attention to the formatting verbally (“Today is the first day of the week...”) akin to previous research (“x is the first day of Spring...”, Dai et al., 2015).

The present studies can also not rule out that the control calendar in some conditions may have played a role in the effect. Specifically, in the conditions run on Sundays, the control calendar showed today as the *last* day of the week which may have *reduced* participants’ motivation to work on their goals right now. Overall, the calendar format effects were somewhat stronger on Sundays ($M_{\text{Difference in Motivation between Conditions}} = .30$ on a 7-point scale) than Mondays ($M_{\text{Difference in Motivation between Conditions}} = .21$). However, while the question of which aspect of calendar format produces an effect (today as first day being motivating vs. today as last day being demotivating) might not be resolved, these studies suggests that calendar formatting *can* affect goal motivation.

Other calendar formats that may affect motivation. Weekly calendars are arguably one of the most frequently consulted forms of time representation. Given that larger temporal categories have also been linked to motivation (e.g., gym attendance peaks at the first *month* of the year, Dai et al., 2014), would similar differences in a yearly calendar produce the same effect? Preliminary evidence from our lab suggests it does not. When participants were randomly assigned to view yearly calendars that varied whether January or July was the first month of the year, their goal motivation did not differ. Plausibility might be a boundary condition of these experimentally induced shifts in time representation.

Motivation in-the-moment might be maximized by a ‘rolling calendar’ which portrays each day as the first day of the next several days, as individuals may be inspired to treat each day like a fresh start. While such calendars are possible (and can be selected as options in popular

calendar apps such as Outlook), they may not be intuitive conceptualizations of time, and the impact of seeing today as the first day might wear off over time.

Additional evidence from our lab also suggests that whether one sees a calendar or not may influence motivation. When participants were randomly assigned to either a calendar condition or a no calendar control condition on either Sunday or Monday, just viewing the calendar reduced motivation relative to viewing a calendar portraying today as start of the week (regardless of weekday). Calendars might prime busy-ness or reduce motivation to work on long-term goals that extend past the represented time period. More research is needed to examine the intricate and subtle effects that calendars (and other verbal and visual time representations) have on our lives.

Conclusion

Time is an implicit dimension in everything people do and think about. For instance, goals come with temporal subtexts of a goal deadline, how long and when one may pursue the goal, when one might work on it next, and so on. How this temporal subtext is represented – such as the format of calendars we use in our daily life - may rarely be considered but may have meaningful effects on how motivated we are to pursue personal goals at one given time and how much progress we make towards those goals.

Open Practices

The preregistrations, the unabridged surveys, and the data are available at <https://bit.ly/2JI8RIP>.

References

- Ayers, J. W., Althouse, B. M., Johnson, M., Dredze, M., & Cohen, J. E. (2014). What's the healthiest day?: Circaseptan (weekly) rhythms in healthy considerations. *American Journal of Preventive Medicine*, *47*(1), 73-76. doi: 10.1016/j.amepre.2014.02.003
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Consolvo, S., Klasnja, P., McDonald, D. W., & Landay, J. A. (2009). Goal-setting considerations for persuasive technologies that encourage physical activity. *Proceedings of the 4th International Conference on Persuasive Technology, USA*, *8*. doi: 10.1145/1541948.1541960
- Corcoran, K., & Peetz, J. (2014). Looking towards the past or the future self: How regulatory focus affects temporal comparisons and subsequent motivation. *Self and Identity*, *13*(1), 81-99. doi: 10.1080/15298868.2012.762614
- Dai, H., Milkman, K. L., & Riis, J. (2014). The fresh start effect: Temporal landmarks motivate aspirational behavior. *Management Science*, *60*(10), 2563-2582. doi: 10.1287/mnsc.2014.1901
- 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. doi: 10.1177/0956797615605818
- 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. doi: 10.1177/1948550617691099

- Lewis Jr, N. A., & Oyserman, D. (2015). When does the future begin? Time metrics matter, connecting present and future selves. *Psychological Science*, 26(6), 816-825. doi: 10.1177/0956797615572231
- Myrseth, K. O. R. (2009). *Activating self-control: Isolated versus interrelated temptations* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Global. (Order No. 3369374)
- Peetz, J., & Epstude, K. (2016). Calendars matter: Temporal categories affect cognition about future time periods. *Social Cognition*, 34(4), 255-270. doi: 10.1521/soco.2016.34.4.1
- 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. doi: 10.1037/a0030477
- 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. doi: 10.1177/0146167213501559
- Pennington, G. L., & Roese, N. J. (2003). Regulatory focus and temporal distance. *Journal of Experimental Social Psychology*, 39(6), 563-576. doi: 10.1016/S0022-1031(03)00058-1
- Tonietto, G. N., & Malkoc, S. A. (2016). The calendar mindset: Scheduling takes the fun out and puts the work in. *Journal of Marketing Research*, 53(6), 922-936. doi: doi.org/10.1509/jmr.14.0591
- Tonietto, G. N., Malkoc, S. A., Nowlis, S. M., & Diehl, K. (2018). When an hour feels shorter: Future boundary tasks alter consumption by contracting time. *Journal of Consumer Research*. doi: doi.org/10.1093/jcr/ucy043

- Tu, Y., & Soman, D. (2014). The categorization of time and its impact on task initiation. *Journal of Consumer Research*, *41*(3), 810-822. doi: 10.1086/677840
- Welding, K., De Leon, E., Cha, S., Johnson, M., Cohen, J. E., & Graham, A. L. (2017). Weekly enrollment and usage patterns in an Internet smoking cessation intervention. *Internet Interventions*, *9*, 100-105. doi: 10.1016/j.invent.2017.07.004
- Wilson, A. E., & Ross, M. (2001). From chump to champ: People's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology*, *80*(4), 572-584. doi: 10.1037/0022-3514.80.4.572
- Wilson, T. D., Wheatley, T., Meyers, J. M., Gilbert, D. T., & Axson, D. (2000). Focalism: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, *78*(5), 821. doi: 10.1037/0022-3514.78.5.821