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Clock Time versus Event Time: Temporal Culture or Self-Regulation? \*

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## Abstract

Cross-cultural research documented two types of temporal culture governing the way individuals schedule tasks over time: clock-time, where individuals let an external clock dictate when tasks begin/end; and event-time, where tasks are planned relative to other tasks and individuals transition between them when they internally sense that the former task is complete. In contrast with this prior literature – that credits culture as the reason for variation in temporal norms – we show in two experiments that individuals choose clock- versus event-time as a self-regulation strategy to achieve a regulatory goal (efficiency vs. effectiveness). A third experiment shows that this strategy enhances confidence and performance on a task. Participants solved significantly more math problems when their task scheduling (clock- vs. event-time) matched their regulatory state (promotion vs. prevention). Since clock-/event-time may *both* lead to superior performance, clock-time is not the single best way to organize productive activities in industrial societies – a result that counters a foundational principle of modern economics.

Keywords: Time organization; Task performance; Self-regulation.

### Clock Time versus Event Time: Temporal Culture or Self-Regulation?

Time order events. It is a continuum on which activities occur in succession from past to present to the future (Mifflin, 2010). This fundamental law of physics and social interaction (Newton, 1687; Macey, 1994) finds distinct expressions in different societies. In particular, cross-cultural research has documented two types of temporal culture governing the way individuals schedule tasks over time (Lauer, 1981; Levine, 1997): 1) “clock-time,” where individuals divide time into objective and quantifiable units, and let an external clock dictate when tasks begin/end; and (2) “event-time,” where tasks are planned relative to other tasks, and individuals transition from one to the next when they internally sense that the former task is complete (Lauer 1981). Individuals in western societies mostly organize their day using clock-time – breakfast at 8am, work from 9am to 5pm, dinner at 6pm. While the reliance on clocks can be traced back to the use of sundials in ancient times, the importance of clock-time for industrialized societies became full-blown with Taylorism, which advocated “one best way” to achieve maximal performance on a task by defining a supposedly optimal, standard time that should be spent on it (Taylor, 1911). To date, the superiority of the clock through its impact on efficiency remains a foundational principle of modern economics. In spite of it, some cultures and even some individuals within cultures still function in event-time: work begins after breakfast ends, and dinner begins once individuals feel they should “call it a day” at work. Anchoring on the clock to schedule activities still makes little sense to much of the world today (Levine, 1997).

Past cultural research has presented the tendency to rely on event-time versus clock-time as a product of ingrained social norms (Levine, 1997). In contrast, we suggest that the choice between event- and clock-time may be more than a cultural artifact. We propose that individuals

may adopt event- or clock-time as a self-regulatory strategy, and – as a result - show that *both* event- and clock-time can lead to superior performance. How so? The main difference between these ways of scheduling tasks is that the decision to move to the next task is based on an internal cue in event-time versus an external cue in clock-time. We propose that this difference allows individuals to better serve the motivational goals defined by their regulatory state. A motivational theory consistent with the adoption of event- or clock-time is regulatory focus theory (Higgins, 1987), which distinguishes between two self-regulation systems that foster different patterns of exploration: prevention and promotion (Crowe & Higgins, 1997; Liberman, Idson, Camacho, & Higgins, 1999). The prevention system focuses on avoiding undesirable end-states, which triggers a drive to minimize mistakes, while the promotion system focuses on approaching matches to desired end-states, which triggers a drive to do as well as possible on tasks in order to maximize “hits” (Higgins, 1998).

When completing one of several tasks, the prevention system will encourage individuals to work on it until they believe mistakes no longer exist, while promotion individuals will persevere until they have reached the best possible outcome. To ensure they have avoided all mistakes, prevention individuals can only rely on their internal sense: it is a more objective assessment of performance than any external temporal cue, as the latter cannot indicate when mistakes have been avoided or corrected. In contrast, promotion individuals cannot rely on their internal sense with such confidence. Because there is always “room for improvement,” their search for the best possible outcome may never end. In other words, their internal sense is a subjective assessment of performance, and relying on it to decide when to end a task would be an inefficient task-scheduling algorithm. For that reason, they should prefer a more objective cue of their task-related progress, such as a clock, which ensures that both the present and the next task

get completed. In sum, we predict that individuals schedule tasks in event- versus clock-time because it enhances their overall confidence and actual performance on tasks depending on their regulatory state.

In two experiments, we tested the prediction that prevention-oriented individuals should prefer to move from one state to the other only when they are internally reassured that the task is complete, therefore striving to be more effective, while promotion-oriented individuals should prefer to move from one state to the other only when they are externally probed to do so therefore striving to be more efficient. A third experiment examines whether individuals actually perform better on a task when their way of scheduling matches their regulatory state.

### Experiment 1

Sixty-five online participants were presented with one of two task-organizing methods: a to-do list (where tasks can be listed without a specific time frame) and a calendar (where tasks can be arranged at specific times/dates) in a counterbalanced order. The to-do list (calendar) reflected an event-time (clock-time) task framing. Participants were asked to (1) choose either the to-do list method or the calendar method to organize 12 fictitious weekly tasks and (2) explain the reason for their choice. Subsequently, they completed the General Regulatory Focus Measure (GRFM, Lockwood, Jordan, & Kunda, 2002).

Using the GRFM, we calculated the discrepancy between the promotion and the prevention score. Participants whose discrepancy score was negative (positive) were considered as more prevention (promotion)-oriented (Appelt, Zou, Arora, & Higgins, 2009; Higgins, Roney, Crowe, & Hymes, 1994).

We found a significant interaction of Task scheduling choice (to-do list vs. calendar) and Regulatory focus (prevention vs. promotion), such that prevention-oriented participants chose the

to-do-list more often (68.2%), while promotion-oriented participants chose the calendar more often (60.5%;  $\chi^2 = 4.78$ ,  $p = .03$ ,  $V = .27$ ). To understand why, two independent judges coded participants' reasons for their choice (reliability = 89%). Generally, 83.33% of prevention individuals reported effectiveness (i.e., doing tasks well) as the main reason for their choice, whereas 88.46% of promotion individuals invoked efficiency (i.e., finishing tasks on time). Results were also consistent with our predictions within each scheduling option: Among participants who chose the to-do list, prevention-oriented participants were concerned with effectiveness more than promotion-oriented participants ( $P_{\text{PREV}} = 87\%$  vs.  $P_{\text{PROM}} = 23\%$ ;  $Z = 5.36$ ,  $p < .001$ ,  $r^2 = .44$ ). Among participants who chose the calendar, promotion-oriented participants were concerned with efficiency more than prevention-oriented participants ( $P_{\text{PROM}} = 44\%$  vs.  $P_{\text{PREV}} = 20\%$ ;  $Z = 2.43$ ,  $p < .01$ ,  $r^2 = .09$ ).

## Experiment 2

In Experiment 2, we wanted to replicate the results of Experiment 1 and test the relation between the preference for clock- versus event-time and self-regulation by manipulating self-regulation instead of measuring it. In the beginning of the Holiday season, 47 undergraduates (age = 20.3 years, 29 women) took part in a brief study in return for course credit. To prime a promotion or a prevention focus, we had participants complete one of two versions of a regulatory focus manipulation adapted from prior research (Freitas & Higgins 2002; Higgins et al. 1994; Pham & Avnet 2004). The promotion version was titled "Hopes and goals across time study" and requested participants to think about the hopes and goals they had in the past, write them down and then report how these hopes/goals changed over time. The prevention version was titled "Duties and obligations across time study" – participants were instructed to think

about the duties and obligations they had in the past, write them down and report how these duties/obligations changed over time.

After completing this first task, all participants were presented with the description of a fictitious new service that allegedly had been developed by fellow students and was going to be launched the following week. The core service consisted of the help of a personal shopper during customers' Holiday shopping, who would advise and assist them in achieving their shopping goals. Participants were told that the service providers were thinking of creating one of two platforms for this service: a first option was to hire the personal shopper for a chosen number of hours, which the service estimated would allow the purchase of a certain number of appropriate gifts (i.e., the service would follow a clock-time schedule). A second option involved hiring the assistance of the personal shopper for as long as it took to purchase the gifts customers would be most satisfied with (i.e., the service would follow an event-time schedule). Further, participants read that it took around half an hour to find an appropriate gift on average. Thus, for the first option, it would take around 5 hours to purchase 10 gifts. For the second option, there was no time limit but participants were assured they would get the "perfect" gifts. Participants were asked to report which of the two options they would prefer, assuming the cost of these options would be the same.

Similar to the results in Experiment 1, we found that participants were more likely to choose the perfect gift option in the prevention condition (83.33%) than in the promotion condition (48%) while participants were more likely to choose the per hour option in the promotion condition (52.17%) than in the prevention condition (16.7%;  $\chi^2 = 6.59, p = .01, V = .37$ ).

Together, Experiments 1 and 2 show that individuals choose event- versus clock-time because of motivational goals (effectiveness vs. efficiency) that are consistent with their regulatory state (prevention vs. promotion). These results offer preliminary support to our hypothesis that prevention individuals prefer being more effective and therefore use a method that allows them to move to the next task based on an internal cue, while promotion individuals' prefer to be more efficient and therefore use a method that allows them to move to the next task based on an external cue such as the clock. A critical question, then, is whether in addition to using task scheduling as a self-regulation strategy, the adoption of event- versus clock-time can also enhance individuals' *actual* performance. Experiment 3 directly addresses this question. We exposed participants in different chronic regulatory states to math problems for which there is only one correct solution, and forced them to adopt an event-time or a clock-time strategy while working on the problems. We expected that the fit between the adoption of an event- versus a clock-time strategy and a prevention versus a promotion focus would both enhance individuals' confidence that they performed better at solving the problems as well as help individuals actually solve more problems correctly.

### Experiment 3

Seventy-nine online participants reported their chronic regulatory focus using the Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001) before they solved eight GMAT math problems. We manipulated the reliance on event-time versus clock-time by telling participants that they would be rewarded on either the amount of questions completed correctly (an event-time strategy) or the quantity of questions completed within 20 minutes (a clock-time strategy). All participants were stopped after 20 minutes. We measured participants' confidence in their performance by averaging responses to how many questions they estimated they solved



correctly, and how confident they were that they did well (centered: -3.5=not at all; 3.5=very,  $r = .89$ ). We also tracked the number of correct answers to the problems. A negative (positive) discrepancy between the prevention and the promotion RFQ scores suggested a prevention (promotion) orientation (Appelt, Zou, Arora, & Higgins, 2009; Higgins, Roney, Crowe, & Hymes, 1994).

Results showed a significant interaction between Regulatory focus (prevention vs. promotion) and Task scheduling strategy (event-time vs. clock-time) on participants' confidence in their performance,  $F(1,75) = 10, p < .002, r^2 = .11$  (see Table 1). Prevention participants reported higher confidence in their performance when using event-time rather than clock-time ( $M_{EVENT} = .6$  vs.  $M_{CLOCK} = -.5, F(1, 75) = 4.82, p < .04, r^2 = .12$ ), and the reverse occurred for promotion participants ( $M_{EVENT} = -.73$  vs.  $M_{CLOCK} = .19, F(1,75) = 5.19, p < .03, r^2 = .12$ ). Focusing on participants' actual performance, we also found a significant interaction between Regulatory focus and Task scheduling strategy,  $F(1,75) = 10.83, p < .002, r^2 = .12$ . Prevention participants also actually provided more correct answers when using event-time rather than clock-time ( $M_{EVENT} = 4.14$  vs.  $M_{CLOCK} = 2.53; F(1, 75) = 8.06, p < .008, r^2 = .13$ ), while the reverse occurred for promotion participants ( $M_{EVENT} = 2.47$  vs.  $M_{CLOCK} = 3.48, F(1, 75) = 3.60, p < .06, r^2 = .05$ ).

### Discussion

Our findings reveal that individuals schedule tasks in event- or clock-time as a method of achieving a regulatory goal (effectiveness vs. efficiency) and enhancing performance. Our participants felt confident and accurately anticipated that the scheduling of their activities using event- or clock-time would enhance their task performance depending on their regulatory state.

This research makes three contributions to the literatures on time and self-regulation.

First, the distinction between event- and clock-time cannot be considered as a mere cultural artifact. Even within a clock-time society, such as the United States for example, individuals' maximal performance of a task will vary depending on their regulatory state. Our second contribution is that we document how different regulatory foci – prevention versus promotion - trigger a preference for event- versus clock-time respectively. This insight adds to the prior research showing that goal pursuit does not occur in a temporal vacuum. Regulatory states profoundly shape temporal aspects of goal pursuit, whether it is the timing of goal pursuit (Freitas, Liberman, Salovey & Higgins, 2002), the interpretation of time elapsing during goal pursuit (Sellier & Chattopadhyay, 2009), or the timing of the movement from one state to another during goal pursuit (Avnet & Higgins, 2003). We find that regulatory states also cause us to arrange our activities on the time continuum differently in order to get closer to desired end-states.

Finally and importantly, our findings suggest that *both* event- and clock-time can lead to superior performance. Hence, in contrast with what decades of economics research have been advocating, clock-time may not always be the “one best way” to organize activities in modern industrial societies.

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